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ENVIRONMENTAL ASSESSMENT BOARD

VOLUME: 134

DATE: Tuesday, September 12th, 1989

BEFORE: M.I. JEFFERY, Q.C., Chairman

E. MARTEL, Member

A. KOVEN, Member

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EA-87-02

HEARING ON THE PROPOSAL BY THE MINISTRY OF NATURAL RESOURCES FOR A CLASS ENVIRONMENTAL ASSESSMENT FOR TIMBER MANAGEMENT ON CROWN LANDS IN ONTARIO

IN THE MATTER of the Environmental Assessment Act, R.S.O. 1980, c.140;

- and -

IN THE MATTER of the Class Environmental Assessment for Timber Management on Crown Lands in Ontario;

- and -

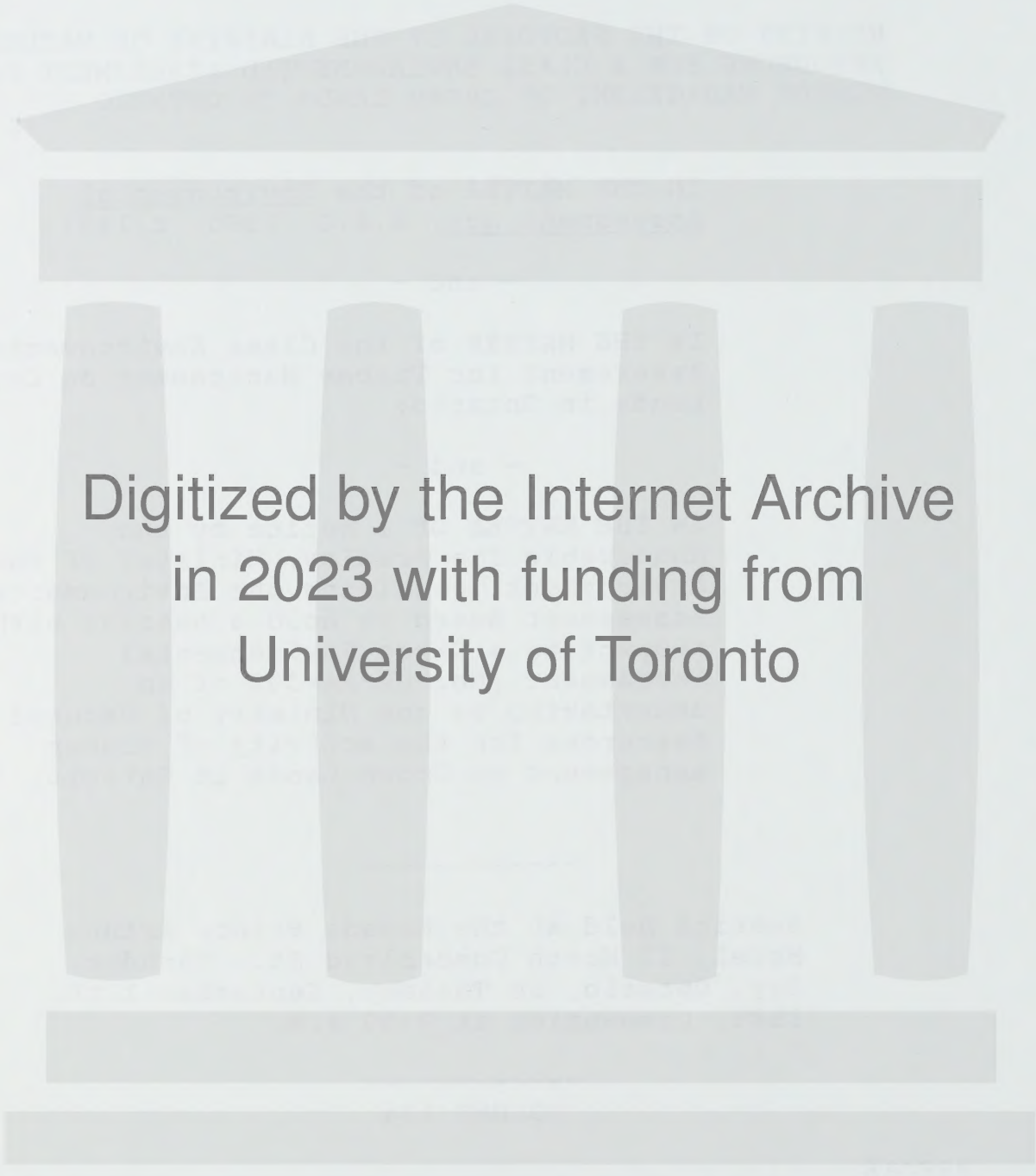
IN THE MATTER OF a Notice by the Honourable Jim Bradley, Minister of the Environment, requiring the Environmental Assessment Board to hold a hearing with respect to a Class Environmental Assessment (No. NR-AA-30) of an undertaking by the Ministry of Natural Resources for the activity of timber management on Crown Lands in Ontario.

Hearing held at the Ramada Prince Arthur Hotel, 17 North Cumberland St., Thunder Bay, Ontario, on Tuesday, September 12th, 1989, commencing at 9:00 a.m.

VOLUME 134

BEFORE:

MR. MICHAEL I. JEFFERY, Q.C.	Chairman
MR. ELIE MARTEL	Member
MRS. ANNE KOVEN	Member



A P P E A R A N C E S

MR. V. FREIDIN, Q.C.) MS. C. BLASTORAH) MS. K. MURPHY) MS. Y. HERSCHER)	MINISTRY OF NATURAL RESOURCES
MR. B. CAMPBELL) MS. J. SEABORN)	MINISTRY OF ENVIRONMENT
MR. R. TUER, Q.C.) MR. R. COSMAN) MS. E. CRONK) MR. P.R. CASSIDY)	ONTARIO FOREST INDUSTRY ASSOCIATION and ONTARIO LUMBER MANUFACTURERS' ASSOCIATION
MR. H. TURKSTRA	ENVIRONMENTAL ASSESSMENT BOARD
MR. J. WILLIAMS, Q.C. MR. B.R. ARMSTRONG MR. G.L. FIRMAN	ONTARIO FEDERATION OF ANGLERS & HUNTERS
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MR. R. EDWARDS) MR. B. McKERCHER)	NORTHERN ONTARIO TOURIST OUTFITTERS ASSOCIATION

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MR. J.W. ERICKSON, Q.C.) MR. B. BABCOCK)	RED LAKE-EAR FALLS JOINT MUNICIPAL COMMITTEE
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I N D E X O F P R O C E E D I N G S

I N D E X O F E X H I B I T S

---Upon commencing at 9:10 a.m.

THE CHAIRMAN: Good morning. Be seated, please.

Just before you start, Mr. Hanna -- Ms. Blastorah, where did we end off yesterday with when you are going to commence?

MS. BLASTORAH: Well, of course it depends on how much Mr. Hanna has to do, but I was assuming that I would commence this afternoon allowing for some time - re-examination I assume you mean - that I would commence this afternoon after -- I was hoping for an appropriate break to prepare questions based on the examination this morning, but I certainly made an effort last night to prepare the balance of my re-examination up to this morning's.

THE CHAIRMAN: And when is Mr. Freidin prepared to go?

MS. BLASTORAH: Similarly, he was assuming he would start tomorrow morning. That's not necessarily his wish, but certainly that was what he was assuming.

THE CHAIRMAN: Okay.

BRUCE ADAMSON,
SERGE TENAGLIA,
NEVILLE WARD,
GORDON PYZER,
DAVID M. HOGG, Resumed

CONTINUED CROSS-EXAMINATION BY MR. HANNA:

Q. Mr. Ward, I have a small number of questions here that I'd like to just finish off from where we broke yesterday and then I would -- I have some questions for Mr. Tenaglia and Mr. Adamson and, I've saved Mr. Hogg to the last. So if I could just finish up these questions.

Now, we were referring yesterday when we left off to these exhibits, 808 and 809 and 367. Could you get those out, please. Now, I'm looking at your letter which is Exhibit 367 and you make reference there to an article by Jeffery?

MR. WARD: A. Mm-hmm.

Q. At the bottom of the page under the first point, that paragraph, and you indicate there that:

"Skid trails and roads may occupy more than 25 per cent of the total logged area."

A. And that is what was stated in Jeffery's paper.

Q. In your experience, would this apply also to Ontario?

A. I haven't actually measured the

amount of road area in a harvested area, so I'm not too sure what percentage it would be. I believe that the Ministry uses something like 20 -- or 5 per cent, and that may be. I'm not sure whether that just includes the primary and the secondary roads or whether it includes tertiary roads or skid trails or not.

Q. Mr. Tenaglia or Mr. Adamson?

MS. TENAGLIA: A. The figure that's normally used in deductions during the calculation of the maximum allowable depletion is usually in the range of 3 to 5 per cent. That's generally in the area that is going to be used -- an area that is generally -- where the operations are going to take place, not necessarily over the entire management unit.

Q. Right. But that 3 to 5 per cent, does that include tertiary roads and skid trails or is that secondary and primary roads?

A. Generally secondary and primary roads because the premise is that tertiary roads will generally regenerate.

Q. If we were to include in tertiary roads, would the 25 per cent figure be unreasonable in your view?

A. Yes, I think it would be unreasonable.

Q. What would be a more reasonable number from your point of view?

A. I don't think I'd take a guess. I don't know that there has ever been a study done either to try to determine the area covered by primary, secondary and tertiary roads on any particular management unit.

Q. Mr. Ward, if a member of the public were interested in attempting to predict the potential erosion from a proposed forest access plan and harvesting plan, it would be extremely difficult since the location of the tertiary roads are not known until the construction phase; is that correct?

MR. WARD: A. Yes, we would be able to determine the location in the five-year plan, you'd have to --

Q. But not the tertiary roads?

A. That's right, mm-hmm.

Q. Can we now look at page 2 of Exhibit 367, please, and I'm looking at the last paragraph there under Point 2. It starts with: "Brouha...".

A. Right.

Q. I believe that's responding in part to a graph that's also on page 4 of Exhibit 808; is that correct?

A. That's correct.

Q. Perhaps for the purposes of the Board you could just explain that graph on page 4 of Exhibit 808?

A. Well, basically this is a hypothetical fishery production potential versus the percentage of different hypothetical watershed manipulated and it's by a fellow named Paul Brouha. Basically we are looking at: some watershed manipulation may increase fishery production potential. I think he's talking more about maybe adding extra nutrients and that type of thing to the low waterbody and increasing productivity.

But if you manipulate the watershed too much in terms of getting a lot of road construction, harvesting, then you may get some of the detrimental impacts such as sedimentation and maybe excessive nutrients or so on. I'm not sure what the factors were that he considered.

But the more you do of the manipulation of a watershed the more problems you can have for the fishery and, therefore, the production potential can decrease. And he sort of had a graph that indicates that there may be some watersheds that are more resistant to disturbance or manipulation than other

ones and so you had a resistant watershed curve and a sensitive watershed curve.

And in terms of the third -- this is an area that I put on in terms of its curve roughly, if about 33 per cent of his watershed manipulated, you start to see the curve going down and the fishery production declining. And based on some of the literature that I have read in terms of manipulating watersheds, like cutting, you know, 10 or 15 or 20 per cent of a watershed you can start to see some changes in water quality, more increased sedimentation and so on.

It varies depending on the literature that you review in the area that they have done these studies, but that's something I used for this -- purposes of this article and it's a simplification, but basically saying that if you start moving -- or changing more than a third of a watershed at any one point in time you may be causing problems for the fishery.

So that's basically the gist of that.

Q. And is that not captured on page 4 in the second last paragraph there, the last sentence where it says:

"A requirement that only a third of a

watershed can be cut at once would help minimize fluctuations and water yields and temperatures, thereby benefiting fisheries."

A. Yeah, basically that's it, you know.

Q. And back to Exhibit 367. When you're responding there to the criticism that was raised in Exhibit 809 you're basically justifying why you maintain the position that you took in the paper; is that correct?

A. Where are you referring to in --

Q. I'm sorry, I'm on page 2.

A. Okay. In 809?

Q. No, no, I'm sorry, I'm in 808 --

A. Mm-hmm.

Q. Oh, I'm sorry, I'm at 367.

A. Okay. And on page 2?

Q. Yes, on the last point there at the bottom.

A. Mm-hmm. Right, yes.

Q. Has your recommendation been incorporated in the proposed timber management planning process in any way?

A. In terms of watershed manipulation?

Q. Yes.

A. No.

Q. One last question on this. Mr. Ward, I believe one of the central conclusions in the material that you've referenced, particularly Brouha's article, is that each watershed responds differently?

A. Mm-hmm.

Q. And there's this need to look at each watershed independently or whatever. Also each fishery responds differently; is that not correct?

A. Yes, it's possible.

Q. So not only do you have to know information about the watershed, you have to know information about the fishery to be able to decide what's an appropriate level of manipulation of the watershed?

A. Mm-hmm.

Q. Now, does the minimum information policy that applies in terms of the fisheries guidelines, does that apply to water crossings?

A. Well, the policy was really established for the Fish Habitat Guidelines, not for the road guidelines. But in terms of knowing what fish species are present in waterbodies, it would assist you in applying the road guidelines. I'm thinking particularly of identifying potential fish migration

routes.

If you know that there are certain species of fish downstream and you know the water crossing is going to occur between that lake and, say, upstream rapids or something which has potential for, say, walleye spawning then you've got pretty good evidence that that isn't going to be a migration route, as long as there's no other physical barriers for the fish to swim. So some of that minimum information could be used for the road guidelines.

Q. I certainly agree that it could be used. My question was, though: Does that policy apply for water crossings?

A. No, it doesn't.

Q. Thank you. Mr. Tenaglia, I believe you're responding to paragraph 6 on page 33 of the witness statement?

MR. TENAGLIA: A. Yes.

Q. Now, you've listed there seven, what I will call, decision variables that one would use to design a road network?

A. Correct.

Q. Now, I expect you're familiar with the concepts of optimization, in particular as it is used by Dr. Baskerville in his audit report and many of

his other writings?

A. Well, it has been some time since I've read Mr. Baskerville's report.

Q. But you have an understanding of that and the types of concepts he is putting forward in terms of optimization?

A. Yes.

Q. Would you agree that the design of a road network is one of the classic cases where formal optimization techniques are often applied?

A. They certainly could apply; yes, I would agree with you.

Q. And that they have been applied?

A. I don't know that I could answer that.

Q. Do you have any experience in developing formal optimization systems for road networks?

A. No, I don't.

Q. Do you know whether this will be discussed in Panel 15?

MS. BLASTORAH: Mr. Chairman, point of clarification. Are we talking about optimization in a construction of road network planning of road networks generally or with regard to forest access roads?

MR. HANNA: Forest access roads is what I was referring to, Mr. Chairman.

MR. TENAGLIA: Oh, they'll certainly be discussing selection of road alternatives. I don't know that they are going to be discussing optimization.

MR. HANNA: Q. Thank you. Now, regarding these seven criteria that you have on page 33, is it not true that one must make tradeoffs among these seven decision criteria to arrive at a road network design?

MR. TENAGLIA: A. Absolutely. Not in all cases, in cases -- some cases there is no tradeoffs required.

Q. A dominant solution but there is no tradeoffs; in other words, there's a clearly best option that is best from all seven criteria's point of view?

A. Mm-hmm.

Q. But in other cases that may well not be the case?

A. That's right.

MR. HANNA: Mr. Chairman, can I just have a moment.

---Discussion off the record

MR. HANNA: Q. Mr. Adamson, in Document

No. 2, which I believe is the report that supports your evidence, I believe it's page 134, there is a section there on optimization; is there not?

MR. ADAMSON: A. Yes, optimization factors.

Q. Would you suggest that this is the state-of-the-art in terms of formal optimization of road networks?

A. It's the way things are done in Ontario, I believe. I'm not familiar enough to say whether it's state-of-the-art in other jurisdictions.

Q. Thank you.

A. Certainly the location of access roads is much different than highways and that's where most of the state-of-the-art developments occur in road construction.

Q. I take it you're not familiar with the report entitled: Four Analytical Approaches to Integrating Land Management and Transportation Planning on Forest Lands published in 1986?

A. No, I'm not.

Q. Mr. Tenaglia, in your reading material last night there was an article by a Mr. Williams; is that correct?

MR. TENAGLIA: A. Correct.

Q. I would like to ask you a few questions about that.

MR. HANNA: Mr. Chairman, I would like to enter it as the next exhibit.

THE CHAIRMAN: Very well. It will be Exhibit 810.

MR. HANNA: (handed)

THE CHAIRMAN: Thank you.

---EXHIBIT NO. 810: Excerpt of report by Williams.

MS. BLASTORAH: Mr. Chairman, unfortunately I gave away my copy of the excerpt that Mr. Hanna has provided to the witness, and I note that it's not -- I don't believe it is the entire report. I was just wondering are you intending to file the entire report or just parts?

MR. HANNA: I'm sorry. I'm only going to refer to those pages that are submitted, Mr. Chairman. It is a full report, it is by the Ministry. I simply didn't see the reason of having to go to the unnecessary expense of photocoping a 70-page report seeing I'm not going to refer to any of the other parts.

MS. BLASTORAH: Well, Mr. Chairman, I happen to have a copy of it here that I can provide to the witness. I wasn't aware that this was the same

document until this morning, so I didn't point out to the witness that it was an excerpt and I don't know whether he has found that out for himself.

So I would just leave it to Mr. Tenaglia to indicate if he thinks he needs to review a further portion of the report. I don't know what part Mr. Hanna is intending to refer to. The excerpt may be sufficient, it may not.

THE CHAIRMAN: Well, let's proceed with the questions and then we will determine it.

MR. HANNA: Perhaps just for the record, Mr. Chairman, you will note in the copies that I gave you that the first four pages are (a), (b), (c) and (d). I did that only for clarity.

They were originally Roman numeral pages (i) and (ii) and then (i) and (ii) again and then the executive summary is (i) and (ii), so I -- just so that you note that that changed.

THE CHAIRMAN: Thank you.

MR. HANNA: Q. Now, Mr. Tenaglia, pages (a) and (b) are written by Mr. Armson; is that correct?

MR. TENAGLIA: A. Yes.

Q. Now, could you look there at the last paragraph in the forward written by Mr. Armson and particularly the last sentence that indicates that:

"The purpose of this study was to develop an analytical model that could have more general application."

I'm wondering, did you attempt to use this model in any way in your analysis?

A. In my analysis of what?

Q. The planning and laying out of road access?

A. No. Again, the model that was used was a modification of OWOSFOP which is the model which the Ministry uses in determining calculations of allowable cut. We did not use the same model in any of our timber management planning exercises.

Q. Can we look page (d), please, and I'm looking at the second paragraph and the last two sentences there starting with:

"Each unit..."

A. Yes.

Q. Perhaps you might just read those two sentences.

A. "Each unit must be managed and roaded according to the dictates of the forest stand dynamics and the local opportunities and constraints. Equally, no simple roading strategy can be

designed without limiting the forest management options."

Q. You would agree with this?

A. Definitely.

Q. I take it that you would also agree that in order to devise the best roading strategy that one must consider a great number of spacial and temporal factors?

A. What do you mean by spacial and temporal factors?

Q. Fine. Spacial I'm referring to, if you will, the geographic distribution of the factors that would affect the best roading strategy; and the temporal component is that decisions we make today in terms of where we build roads affect future options in terms of forest management and other uses of the forest land?

A. Yes, I would agree with that.

Q. Now, is that not the essence of the last paragraph here?

A. Yes, generally I would agree with you.

Q. Would you agree --

A. Again, this is just one tool -- Mr. Williams indicated that this is just one tool in order

to help whoever is preparing a plan determine the general strategy in which to formulate an access -- an access plan, and he did indicate that he simplified his model, that there is a lot of untested assumptions in his model, and it really just tells you a relative indication of which type of management techniques would cost more.

Q. The second --

A. And actually the scope of his analysis is rather narrow because he did not factor in a lot of the other items that come into play in terms of determining which alternatives should be selected.

Q. The second sentence there which says: "Increasingly we are compelled to draw on modelling and decision analysis tools to assist us in making choices in a complex, economic and biological environment." Would you agree with that statement?

A. I certainly would. I think it helps us immensely in determining and helping us work with timber management planning.

Q. Can we turn to the first page in the executive summary, please, and I'm looking there specifically at the last paragraph, the first sentence, it starts with:

"The simulation results..."

A. Yes.

Q. And I take it you would agree with that statement?

A. Yes, I wouldn't argue with that.

Q. Now, Mr. Williams in his analysis did not incorporate non-timber values in the analysis; in fact I think that was part of the point that you were just making before?

A. That's right.

Q. Would you agree that -- would you agree that if we included in this analysis --

A. If we included?

Q. If we included, yes. If we included in this analysis or a similar type of analysis non-timber values, for example wildlife habitat relationships, there would be a close inter-relationship with the other three factors mentioned here?

A. Yes, if you could include it, and that's a big if in terms of determining what the value of those other values are.

Q. Now, this is a question you may not be able to answer in light of what you've indicated to me in terms of your experience in terms of

optimization, but I'm going to ask it to you and you may say I can't answer it, but I'll try it.

Unless non-timber values are explicitly included in these types of models, is it not virtually impossible to arrive at an optimum solution?

A. No, I don't think I would agree with you. I think we can derive an optimum solution through the process that we've laid out forward here -- laid forward out here.

Q. Could you turn just briefly to the Baskerville Audit Report on page 73.

A. Yes.

Q. And I'm looking at that first full paragraph there at the top of the page. And I believe this paragraph - perhaps just take a minute, I think you should just read that paragraph and then I'll - the reason I'm going to ask you about this paragraph, so you get the context, is I believe he's talking about this problem of optimizing one component and not all components at the same time, and I'm going to ask you some questions about that.

MR. PYZER: A. Just while he is reading it though, Mr. Hanna, the only point I would make is that, again, that was what I dealt with yesterday in the sense that we don't plan roads, looking at a road

going in with the objective of optimizing all other program areas.

We go into it -- the way the Ministry of Natural Resources does its planning is in fact we do do things like wildlife management plans, we do do fisheries management plans, and so you look at the road not as a road to optimize in the absence of having done no other planning, we look at it from the perspective that we have done these other plans and that's the big difference between all of this.

A vast majority I think of what you've given us to read is that those other planning exercises seem to be absent and so you look at the road, or the road planning as being the mechanism by which you optimize all those other programs. That's totally different.

Q. What are you referring to, Mr. Pyzer, because I'm not at all aware of the examples that I'm referring to that you're suggesting I'm referring to?

A. Just the questions you are asking. Mr. Tenaglia, a second ago -- and it's where I was talking about yesterday in terms of Mr. Baskerville. My impression of what he is saying there -- again, the point I was making yesterday - that was prior to the fact that we had done fish management plans. So Dean

Baskerville isn't even aware of those sorts of things, that was, I believe, 1985 that he was drawing on. We do have a fisheries management plan.

So if you are talking about optimizing fish values, many of those decisions have already been made. In fact I would suggest that, you know, relative to this forum, all of those decisions have been made.

So you don't look at a timber access road and say: Now that we may be building a road in this unit how can we optimize fish resources because from the perspective of commercial fish or sport fish or Indian fisheries or whatever else, those decisions have been made. It's not a question of looking at the road and saying: How can I optimize those other values?

Similarly with wildlife, we are doing a wildlife management plan now on the Alneau Peninsula as one good example using GIS. The decisions that flow out of that will be direction to the timber management that goes on on the Alneau Peninsula. It's not a question of looking at the roads in the Alneau and saying: How can we maximize other programs.

Those other programs have plans that have been planned and they may well say: No roads, or they may say here's the strategies we want you to follow.

The difference I think, and this is how -

and I may be wrong in how I am interpreting your questions - but it seems to be, if we are doing forest management planning and roads are a part of that: How can we optimize all other program benefits. And that may be an approach other jurisdictions want to use, and I think this is the point we're trying to make, that is not the approach we use here.

Q. Mr. Pyzer, I think you have made that point a number of occasions in the transcripts. I appreciate your clarification on this, but in the interest of time I would like to try and move along and not repeat things.

Mr. Hogg, what proportion of the area of the undertaking currently has an approved wildlife management plan?

MR. HOGG: A. I think perhaps in the sense of your question, there isn't a comprehensive plan. You're suggesting it's necessary, but I think you have heard before in Panel 7, Dr. Euler again talking in Panel 10, we feel in fact we do have wildlife -- de facto wildlife planning in the sense of our DLUGS, indicated objectives, we have means of achieving those quantitative objectives, we have means of monitoring, whether or not we achieve those -- that particular objective. In that sense there is a

planning of that sort.

Q. Mr. Hogg, or perhaps Mr. Ward can answer this, are there not DLUG targets for fisheries?

MR. WARD: A. Yes, there are.

Q. And fisheries management plans are an extension of the DLUG targets in terms of the fisheries management; is that correct?

A. Well, the fish management plans have revised the DLUG targets and I know in the northwest region I think all of the targets were revised with newer information and more refinement.

Q. We don't have in the province, Mr. Hogg, comparable wildlife management plans to what we have for fisheries management plans; is that correct?

MR. HOGG: A. Not on a province-wide basis. There has been some local efforts and Mr. Pyzer speaks to one in the Aulneau and he set an example, the beginnings of one in the Red Lake District in the Tedesco Evaluation of Habitat. We have, I guess, plan elements throughout the province.

Q. Thank you. Now, I would like to go back, Mr. Tenaglia, to that paragraph that I was asking you about, and I am looking specifically there at the third sentence:

"There is an attempt..."

Do you see that sentence there?

MR. TENAGLIA: A. Yes.

Q. And I want to know whether you agree or disagree with that statement?

A. Generally I would agree with it, yes.

Q. Thank you. Now, is it your view that there is the potential for major financial impacts in terms of both public and private expenditures among different alternative road network solutions?

A. Can you repeat that?

Q. Sure. Is it your view that there is a potential for major financial impacts in terms of public and private expenditures among different alternative road network designs?

A. Yes. Some roads obviously are going to cost more than other roads depending on which is the alternative that is selected. The costs may not be borne by the public, they may be borne by the company.

Q. I think I mentioned there both -- it could affect both the public and private sector?

A. That's right.

Q. Is it your view that the structure of the road network is contingent on the procedure used to arrive at the best design? Perhaps -- unfortunately that is not as well phrased question as I might.

For example --

A. Structure of the road network is going to be based on the objectives of the plan.

Q. It's my understanding at the present time, with the approach proposed in the timber management planning process, that the manager selects the units to harvest and the timing of the activity and then looks at determining the least cost transportation plan -- well, the seven factors that you have included; is that correct?

A. I think the plan objectives certainly will provide the main direction in terms of the kind of road network a company is going to build, the Ministry in terms of the Crown units is going to build.

Q. But isn't what you do, you look at the eligible stands and you say: Okay. Well, we want to harvest this stand and that stand, and this stand at this time and that stand at that time, and make those sort of decisions and say: Now, how can we best access those stands? Is that not basically what you -- how the process works?

A. It's not quite that simple. That may be the first step, but then we have to introduce all the other factors that we have to -- all the other factors that come into play; integrated resource

management, selective management, moose management, fisheries management.

Q. The constraints in terms of where in areas of concern and all those other things that affect --

A. Well, I wouldn't say the constraints, I would say the plan objectives are.

Q. If I was to tell you that there has been analysis done of basically that approach and an optimization of the system -- Dean Baskerville's approach, the formal optimization approach? Would it surprise you if it had been found that there is a difference in discounted net revenues from the land base of up to $119 per acre annually?

A. I don't know that I would want to comment on that. I don't have a strong economic background.

Q. So you wouldn't have any appreciation what might be at risk or what might be at stake in terms of dfifferent ways of designing the road system?

A. Not from an economic standpoint.

Q. Thank you. Can you turn to page - I am back on Exhibit 810 - and can we turn to (v), and I am looking at the third paragraph. The first sentence, it starts:

"The major conclusion..."

A. Yes.

Q. Perhaps you could read that?

A. "The major conclusion of this study is that two major partners in forest management, government and industry, must make higher front end investments in access when selective management is required."

Q. Thank you. Mr. Hogg, is this similar to the conclusion reached by Racey, et al in Exhibit 518?

MR. HOGG: A. I haven't had the opportunity to review the paper you have been discussing with Mr. Tenaglia, so I'm not exactly certain what all that is about.

Q. Okay. But just that one sentence, without having to go into all the -- I didn't want you to read it from a technical point of view, I didn't really feel it was your area, but I am just asking that particular sentence.

A. I believe the comments are -- the sentiment is similar to that expressed by Mr. Racey, et al, yes.

Q. Thank you, Mr. Tenaglia.

Mr. Adamson. Now, in your witness statement, Mr. Adamson, on page 37, paragraph 22 you indicate there that:

"Water crossings are the single feature of the road access that has the greatest potential for environmental effects."

And you then say that:

"They may constitute a value or a feature which becomes identified as an area of concern."

Now, maybe this is just my way with words, but I was intrigued to see why you used the word 'may' there rather than 'they will constitute a value or feature which becomes identified'.

MR. ADAMSON: A. I think the word should be will. It is our view that water crossings are areas of concern.

Q. Okay. Now, this is with no disrespect to your profession, but I'm sure you've heard it said that virtually anything can be engineered if you throw enough money at it; have you?

A. You are asking me my opinion if that's correct?

Q. I am just asking if you have heard of it?

A. Yeah. We have done some pretty wonderful things even in MNR with enough money.

Q. Now, in terms of - and I am looking at this from an engineering point of view and the types of decisions you are faced with as an engineer - you would agree with me that even within the latitude of the environmental guidelines that there is a potential for varying levels of mitigation, you have to design, if you will, the mitigation for the site?

A. Yes, there is a flexibility there to deal with the specific materials, the problems that might occur at that site and also with the environment within which those actions are taking place.

Q. And so that there is a decision and that decision may well be reached through discussions between people such as yourself and Mr. Ward in deciding what is the appropriate level of mitigation and it's all in how you come to all those sort of site-specific decisions?

A. Yeah. The mandatory standards are phrased as end results; in other words, if erosion and sediment control is what is required, how that is obtained and what mitigation techniques are used to obtain that is subject to discussion.

Q. Okay. Well, that is an interesting

statement in that what you are saying - and perhaps it is somewhat analogous to what we have heard the wildlife biologists say here - is that you have got an objective that you measure against to decide on the appropriate level of mitigation; is that correct?

A. Yes.

Q. Are those objectives quantified and laid down somewhere?

A. No, they are not. I should add, they are quantified in the sense that the protection of water quality and our intent to meet the MOE's water quality objectives, which Mr. Ward referred to yesterday.

Q. Mr. Adamson, to the best of your knowledge has there been any analysis to determine for a representative set of sites that the mitigation measures contained in the environmental guidelines will be adequate to meet the MOE blue book guidelines or water quality guidelines?

A. There has been no scientific study on access roads to show that, but what there has been is experience in building crossings, in review of what other agencies are doing in terms of erosion and sediment control, and we believe that we can adapt what they find to our work and if we follow similar methods

we should end up with similar results.

Q. The Ministry of Transportation being one of those agencies?

A. That is one agency that was reviewed, but beyond that we review syntheses of practice in the United States that are available on erosion and sediment control which governs all the states in the United States.

Q. I am looking now at paragraph 14 in your witness statement, it's on page 35. It indicates the amount of road that is constructed in the province are and I believe on page 108 you indicate that:

"Approximately 1,700 kilometres are constructed or reconstructed each year."

A. Yes.

Q. Is the amount of road constructed in the province on an annual basis reasonably constant, that is a reasonably good average figure to use over the long term?

A. Over the last ten years I think so.

Q. Would you expect this is reasonably applicable for the next 20 to 25 years?

A. I have no idea. It's my understanding there has been an enhanced road construction program over the last few years as a

result of trying to improve timber management, and certainly some of the program -- financial assistance programs I have been involved with. That was one of the objectives, was to put in place a better road network to allow better timber management; the theory being that once that network is in place the need for new primary and secondary roads should decline.

So I would assume that the need for new roads may decline in the future.

Q. And when do you expect that to occur?

A. I don't know. I am not a long-range planner. Certainly in my own work -- our workload in building new roads was much greater in the period 1980-86 than it has been in the last few years.

Q. Does the 1,700 kilometres you refer to here pertain only to primary access roads, or does it apply to all three levels?

A. That would be primary and secondary roads.

Q. Mr. Tenaglia, maybe you can answer this, or Mr. Adamson. What proportion of the productive forest land in the province is accessed at the present time with the existing road network?

Obviously, I am not -- we are talking ballpark figures here, I am not looking for a precise

statistic.

MR. TENAGLIA: A. I don't think I could comment on the boreal forest. In speaking with people from the Great Lakes/St. Lawrence Forest, the general feeling is about 85 per cent of the area in the Algonquin Region anyway is reasonably accessed.

I don't know that there is an estimate for the boreal forest and I wouldn't hazard a guess. It really -- it depends on different units. Some units are very accessible and require no more primary roads; other units are in their infancy stage in terms of development.

A prime example is, for example, the Lake Nipigon Forest, an FMA very well accessed, no more primary roads required from what I recall, just some secondary roads; in comparison the Magpie Forest they are proposing a very ambitious primary road network because the forest is essentially unroaded.

Q. Do you have any view as to how long it will take to access all of the productive forest land in the area of the undertaking?

A. No, I don't.

Q. Are there projections of that nature that you are aware of in the Ministry?

A. I'm not aware of projections like

that. There certainly is projections in timber management -- in each timber management plan in terms of how much roads the company or the Ministry is proposing to build at any period of time.

Q. Right. But bearing they may go for 20 years, 25 years, the timber management plan --

A. Twenty.

Q. 20-year planning horizon. It's quite possible that in many units it won't be fully accessed even after 20 years?

A. Yes, I would agree with that.

Q. Now, I have been through the north on occasion and I am particularly speaking here of the boreal forest and I have always been sort of struck by the frontier nature of access roads - you're sort of going into lands that had never been road accessed before - and I guess what strikes me is that the road network that we are building today in the area of the undertaking will, for all intents and purposes, become the permanent road network in the north for future generations. Is that not a fair statement?

A. The primary roads, I would agree with you there.

Q. I am speaking primarily of primary roads, but it applies also to secondary roads, somewhat

less so, but to secondary roles to a certain extent also?

A. To a much less extent because secondary roads really -- it depends on what the use management strategy is for those particular secondary roads.

Q. But based on your experience, if you were - and perhaps you can't answer this because we haven't had too many second cuts in the boreal forest - but if you were to access a unit for the next rotation, is it likely that you are to design a new secondary access road system notwithstanding a major catastrophic event?

A. Probably, simply because I am sure your harvesting techniques will change over another 30 or 40 years as they have changed over the past 20 and 30 years.

Q. So what is the best alternative today may well not be the best alternative in the future; is that what you're saying?

A. Exactly.

Q. The issue I want to deal with here, Mr. Tenaglia, is this one of the purpose of the roads, and I believe several other parties have spoken to this issue in cross-examination.

And, again, I draw an analogy between what happened in the boreal forest and what happened in southern Ontario. The road network in southern Ontario was set down in the early part of the last century, I am sure you are aware of that?

A. Mm-hmm.

Q. It was set down by the --

THE CHAIRMAN: Well, hold on a second, Mr. Hanna. You can't give evidence yourself on some of these points. You have to phrase your points that you want to make in the form of questions to the witnesses.

MR. HANNA: I apologize, Mr. Chairman.

THE CHAIRMAN: You will have an opportunity to bring all this out at some future date.

MR. HANNA: Yes, I will.

THE CHAIRMAN: I'm not saying you will never have that opportunity.

MR. HANNA: Yes, Mr. Chairman.

Q. It's stated in the EA the purpose of access roads is to provide for timber management activities. In fact, the word primarily was dropped during Mr. Edwards cross-examination; was it not?

MR. TENAGLIA: A. In which document, sorry?

Q. Well, it's actually -- you have asked

me a good question, Mr. Tenaglia. This is one that I didn't have very cross-referenced.

Okay. I am looking at paragraph 2, page 32 of your witness statement, and I believe Mr. Edwards asked you about this and I think it was decided that primarily shouldn't be there.

MR. TENAGLIA: A. I don't recall his line of questioning, I'm sorry.

Q. Well, unfortunately, I can't refer you to the transcripts at this time, so...

THE CHAIRMAN: Does much turn on it?

MR. HANNA: No, sir. I am going to my next question.

Q. Would you agree, Mr. Tenaglia, that once the roads have been constructed and we look at the road network in terms of its alternate uses over the long term, that while timber management activities will still be an important use, a great number of other Crown land related activities will likely be of equal or greater significance?

MR. TENAGLIA: A. Again, that depends on what the use management strategy for that particular road will dictate.

Q. But if the road is open, let's assume it's not a restricted road at this time, it's one of

those others; that statement would be a fair statement?

A. If it's an abandoned road, the road is not being maintained, there is no restrictions on use of that road, yes, other users are going to use that road.

Q. And that use can in turn be equal or greater in significance to timber management activities over the long term?

A. What do you mean by significance?

Q. The amount of use.

A. In terms of numbers of vehicles?

Q. Fine.

A. It's possible.

Q. Would it be your position that the optimal lay of the road network for timber access is likely also to be optimum to service all other Crown land activities?

A. No, I don't think I would agree with you there. In fact, a lot of the alternatives that we may select are alternatives to minimize any potential impacts on other users of the forest.

Q. I'm not sure you understood my question. Just to make sure that you understood it, I will read it again.

Would it be your position that the

optimal lay of the road network for timber access purposes is also likely to be optimum to service other Crown land activities?

A. I don't know that would change my answer.

Q. There is a couple of minor points here, Mr. Tenaglia, I would like to get sorted out and they have to do with road costs. I believe this has been discussed to some length and I'm not planning at all to go back and rehash that.

Just so I'm certain here though, that there is no one on the panel who was able to provide the real costs of private forest companies in terms of access cost; is that correct?

MR. TENAGLIA: A. In terms of the company's contribution to providing access or the company's contribution --

Q. The total costs incurred by forest companies, yes.

A. No, nobody in this panel is able to produce that figure, no.

Q. Okay. On page 109 of your witness statement you indicate there that costs can vary as much as ten thousand to a hundred thousand per kilometre?

A. Yes, that's what Mr. Adamson indicated, yes.

Q. Oh, I'm sorry. My cross-examination here between Mr. Adamson and Mr. Tenaglia is not that clear.

So, Mr. Adamson, I didn't mean to suggest that they weren't your numbers, if you want to jump in, go ahead.

MR. ADAMSON: A. That's the range of prices that's in the evidence.

Q. Mr. Adamson, I presume these are the full costs that the Ministry incurs when it's building roads itself on Crown management units?

A. Based on that, yes, but also based on discussions I've had with industry people who build roads.

Q. I'm looking at page 112 of your witness statement and particularly fig -- I believe it's indicated here Figure 1.1, and this table provides information on road and bridge construction and maintenance costs; is that correct?

A. Yes, that's from the official Ministry statistics publication for that fiscal year.

Q. Now, what I have done here - and perhaps I haven't interpreted this table properly and

you can correct me - what I have done is just calculate the per-kilometre cost based upon the statistics provided here in terms of road construction.

A. Well, I should mention the kilometres there include construction and reconstruction, and a reconstruction project may be simply placing six inches of gravel on an existing 30-kilometre long road, and it would appear there as 30 kilometres of reconstruction. So built into these numbers are apples and oranges.

Q. With the reconstruction project then you would expect that the per-kilometre cost would be much lower than the construction of a new road?

A. Yes.

Q. So that the average numbers here, if anything, are less than the costs of construction of new roads; they certainly aren't greater than the costs of new roads?

A. They would be less, yes. Another thing that may distort these figures if you tried to interpret them that way is the cost of bridges. It may be included in the dollars but it's not counted here, and each year there's a substantial amount of money spent on bridges.

Q. Is the money spent on bridges significantly different among the different programs;

in other words, does the MNR road program tend to have more bridges than the COFIDA program?

A. I would have to think about that. I would say it's probably equally split. I don't think there is a distinction.

Q. Perhaps you can check my figures during the break or whatever, rather than go through a calculation I will just tell you the numbers that I have got here. I will just take the high and the low.

I calculated for the Ministry roads program a cost of about 21,800 per kilometre, and the highest that I calculated here was for the COFIDA program and I had 43,500 per kilometre.

Now, the variation I was surprised at. Is there any reason right now that you'd say: Well, there is clearly a reason for that variation, why one program costs twice what another does to construct and reconstruct roads?

MR. TENAGLIA: A. I think the COFIDA program had certain and different objectives than the normal MNR program. I would have to go back and see what the guidelines for the COFIDA roads program, but I believe it was generally to access inaccessible areas, primarily primary roads.

A lot of the figures for the MNR roads

program may be tertiary roads and secondary roads, general access to a unit.

Q. Mr. Adamson, do these figures include the costs for tertiary road construction?

MR. ADAMSON: A. No.

MR. TENAGLIA: A. I'm sorry, in terms of a lower standard road then.

Q. Oh, so we are into this standard and the classifications, that's how you were referring to it?

A. Yes.

MR. ADAMSON: A. Within the MNR roads program there may be a bigger proportion of reconstruction because it includes roads that aren't necessarily just for timber.

COFIDA was for timber management; the MNR roads program covers other types of roads that the Ministry looks after, cottage roads, recreational access roads, multi-purpose roads.

Q. I just want to get these numbers out of the way just so I understand them. I'm looking now on page 113 and Figure 1.2 and I repeated the same exercise and, in this particular case, despite what we've just heard about the COFIDA program, the costs are about 10,100 per kilometre and the FMA program

comes out to about 23,700 per kilometre.

Now, why would there be the major differences in this particular table?

A. Maybe Mr. Tenaglia can correct me if I'm wrong, but I believe the COFIDA program is up to 50 per cent of the cost of the road to a ceiling.

Q. Well, I'm going back then to 1.1.

A. Which is...?

Q. You have COFIDA being very expensive in 1.1.

A. There's a distinction between these two tables.

Q. Okay.

A. The first one is Crown roads.

Q. Mm-hmm.

A. So if the program funds a road it funds 100 per cent of the cost. The second table is agreements with forest industry to cost share the road cost.

Q. So I should multiply that COFIDA program number there by two?

A. I believe so. I believe so. The program only assists up to 50 per cent.

Q. But that's not the case in 1.1?

A. That's right. In 1.1 they would fund

all of the Ministry's costs to build its own roads.

Q. Okay. If we look at the COFIDA program then between 1.2 and 1.1, in 1.2 the average is say 20,200 doubling it?

A. Yes.

Q. And it's 43,500 in 1.1?

A. Yes.

Q. Is there a reason for that variation as far as you know?

A. I couldn't give a general answer to that.

MR. HANNA: Mr. Chairman, I'm about to switch over to Mr. Hogg and the way things have been going it looks like I'm still on schedule for one o'clock or even perhaps a bit before that, if I'm fortunate.

THE CHAIRMAN: Okay. We will take the break at this time.

MR. HANNA: Thank you, sir.

THE CHAIRMAN: 20 minutes.

---Recess taken at 10:25 a.m.

---On resuming at 11:00 a.m.

THE CHAIRMAN: Thank you. Be seated, please.

MR. HANNA: Q. Mr. Hogg, I would like to

deal with you first with an issue regarding the local overharvesting of moose as a result of access road construction.

And I believe your evidence is that the Ministry does not manage wildlife populations, in particular moose, by closing roads but primarily you manage them through the selective harvest system and hunter controls and other means?

MR. HOGG: A. Our current system is to do it in that fashion, yes.

Q. What would be the average size of a wildlife management unit in the area of the undertaking within which moose inhabit? I'm not -- let's not deal with the deer range, I'm talking primarily boreal forest here now.

A. I guess I'm at a loss to give you an exact figure. Several thousands of -- many thousands of hectares obviously.

Q. The wildlife management unit is the base upon which the quotas and whatever are assigned?

A. Yes, it is, yes.

Q. There's no finer level of geographic subdivision in terms of moose population management than the wildlife management unit?

A. No, we manage at that broad scale of

the wildlife management unit.

Q. Is it typical to have fairly uniform population densities over a wildlife management unit or do you tend to find concentrations of moose within a unit?

A. Well, as Dr. Euler spent some considerable length of time saying in Panel 10, we would expect to find that there is variation in terms of the suitability of habitat and capability of habitat across a wildlife management unit. So there would be some areas where populations are higher, some areas where populations are lower.

Q. Is it reasonable to expect extensive movement of moose across the length and breadth of wildlife management units or, in your view, is there not in fact sub-populations within the wildlife management unit?

A. I'm not certain that sub-population is the exact phrase to use there. Obviously it would be highly unlikely for a moose or a number of moose to wander throughout the full size, the full area of a wildlife management unit.

They will range across perhaps 20, 30 kilometres, that sort of thing, but they are not going to range across the whole management unit.

Q. Just so I have got the right term, would you call it local herd then, would that be a better -- I'm just trying to get the right word to use.

A. I'll settle for that word. I will settle for your terminology.

Q. A local herd?

A. Sure.

Q. Now, is it your opinion that new access roads in combination with extensive clearcuts have the potential of seriously depleting local herds within a wildlife management unit?

A. I think I've indicated that the total process of timber management, at least at its initial stages, could be expected to have that effect, that the roads go in, the habitat is harvested, cut, and the total area is less suitable for moose at that point in time, so they are more vulnerable to hunting as well.

Q. Yes. Are you aware of any studies documenting such impacts?

A. There have been a few cases in Ontario where Ministry staff have documented that effect, yes.

Q. Are they published? I would be interested in looking at them. Can you give me more specific --

A. Well, I believe I cited the two in particular I'm thinking of in my written evidence, Timmerman and Gollat and Eason, 1985.

Q. Okay, thank you. How long, in your opinion, would it take for a local herd to recover from such overharvesting, the harvesting here being through hunting?

A. I believe Mr. Eason in his paper is indicating that the recovery period is approximately three to ten years.

Q. Now, if you can accept a hypothetical here for a moment and, that is that: Would the potential for this type of impact, this local overharvesting, be increased or decreased by reducing the size of the wildlife management units?

A. Can I have that again?

Q. Sure. Would the potential for this type of impact, this local overharvesting, be increased or decreased by reducing the size of the wildlife management units?

A. I guess I don't see the connection between the size of the wildlife management units and the problem you're talking about.

Q. Okay. Maybe I'll expand where I'm coming from. You allocate quotas on the base of

wildlife management units?

A. Correct.

Q. And those quotas are designed to regulate the harvest within that unit?

A. Correct.

Q. Now, if we had smaller units that corresponded to, in the extreme case, the actual area where the local overharvesting is going to occur, we could in fact regulate the harvest so that we wouldn't overharvest in that particular area?

A. Sure. You make very, very small wildlife management units and make many, many more of them throughout the province and manage that in a very specific area in the way we are managing the larger units now.

Q. And that would have administrative ramifications that could be --

A. It's very difficult.

Q. It would be very difficult.

A. Yes.

THE CHAIRMAN: Would that not also have ramifications on the total viable population though as well?

MR. HOGG: I think, Mr. Chairman, our objectives overall might well remain the same to

produce a population of a certain size, but in Mr. Hanna's scenario we simply choose to do -- attempt to achieve that objective by managing smaller units as opposed to larger units. So our objectives might very well remain the same; I expect they would.

THE CHAIRMAN: But if you ended up with avoiding overharvesting of local herds in every case because you had that many more wildlife management units, would you not end up with a larger overall population?

MR. HOGG: And what I'm suggesting is we would manage to hold the population at the level we choose to, as I indicated this morning over a large unit.

THE CHAIRMAN: But you would be increasing the harvesting in order to keep the numbers down; would you not? Doesn't something have to give if you are going to manage so that there's not overharvesting?

MR. HOGG: I think there is a time frame problem here. There is a recovery of habitat after the initial cut and moose population responds accordingly, and we might be able to better track that change in the population and adjust our allocation of tags in that area and we may well be able to adjust the allocation

upwards allowing more hunting because there is a more specific interim management for it.

THE CHAIRMAN: Okay.

MR. HANNA: Q. So in terms of this matter there is a bit of a tradeoff in terms of: You go too small and you've got an administrative -- a potential administrative nightmare if you get down to too small a level; if it's too big, you've got the potential for this local harvesting -- overharvesting problem. Is that correct?

MR. HOGG: A. I don't see the latter situation described as a real problem. We think the units we have selected are appropriate and we have picked objectives for population and for hunting that we expect to occur in that area and we accept that throughout that broader wildlife management unit there is going to be some areas of local, perhaps, what some might call overharvest and then what some might call other areas we call locally underharvested.

The overall effect being we harvest the population at the level we want to harvest them.

---Discussion off the record

MR. HANNA: Q. Would you see any benefit, Mr. Hogg, in having the wildlife management units correspond more closely to the forest management

units both in size and boundaries?

MR. HOGG: A. I think our earlier evidence in other panels was that we consider that unnecessary at this point, and Mr. McNicol talked about boundaries -- the boundaries of the area which we collect information for, the UTM grid system, and it's really what -- the question is: Can you take the information you have for that area and build it up to whatever size unit, be it a wildlife management unit or a timber management unit.

So I guess my opinion is -- the Ministry's opinion is, at this point, it's considered unnecessary.

Q. I'm interested in your opinion.

A. I think it -- my own personal opinion, administratively it would be easier to deal with our forestry counterparts in dealing with actions through a whole single TMU, WMU size unit. As a communications tool, I think it would be a useful thing.

Q. With the proviso that the essential biological data that you've collected for the wildlife management units wouldn't be violated as a result of that?

A. Well, I think that's what you asked.

Q. I think that's what you were referring to with Mr. McNicol's evidence?

A. Exactly, yes.

Q. Yes.

MR. MARTEL: How many wildlife management units are there?

MR. HOGG: Roughly there's in the area of a hundred in the province. In the area of the undertaking, I don't have that number at my fingertip.

MR. MARTEL: Is the problem one of more staff being required if you equalize the numbers, forest management unit versus...

MR. HOGG: Well, all those practical considerations enter into it. But one of the criticisms we've had of the wildlife program in the province generally - and you may be aware of this - is that it gets complicated, people get confused by it.

Every time they cross a line you have to be aware that there's another rule in place, a different season, a different limit on game perhaps, perhaps you need another tag.

MR. MARTEL: Different side of the highway.

MR. HOGG: Different side of the highway. So that when the original wildlife management units

were set up they were set up on a broad ecological basis, but giving consideration to some these practical matters that you and I are discussing now.

So, yes, cost enters into it but other things besides cost if you start talking about making more wildlife management units.

MR. HANNA: Q. Mr. Hogg, you have contact with the hunting groups I believe. With the introduction of the quota system there was quite a bit of resistance within the hunting groups; is that correct?

MR. HOGG: A. I think it's fair to say there was both support and -- supporters and detractors of the system. I think there was general acceptance that something had to be done to improve the moose population in the Province of Ontario and there were a number of options developed and it eventually led to the selective harvest system we have today, or a version of it.

Q. All right. So that there were certain groups that were quite supportive of these increased, if you will, administrative wrangles that you were faced with if you wanted to be a hunter, but that was basically accepted by a number of the groups?

A. It's come to be accepted by a large

percentage of the hunting fraternity, yes. There are still those detractors out there.

Q. There always will be?

A. There always will be.

Q. Is not another way to mitigate the impact of new access on moose populations to reduce the size of clearcuts and to practise more extensive modified cuts, at least adjacent to roads accessed by hunters?

A. I believe Dr. Euler again spoke to this topic at least to some length in his testimony, and I guess I can only repeat that and answer in words of my own that the more standing timber that's left the less vulnerable moose are going to be to the effects of hunting.

Q. Okay. So it follows then that modified cuts will have long-term benefits in terms of moose habitat, which we have gone through extensively in Panel --

A. Did you say without benefits?

Q. No, no, I'm sorry, I'll just start again. Does it not follow then that modified cuts will have long-term benefits in terms of moose habitat but also immediate benefits in terms of reducing the likelihood of overharvesting the wildlife populations?

A. By modified cuts I assume you're talking about the idea of this smaller cut--

Q. Correct.

A. --in the areas where we normally -- or might have had larger cuts at one point in the past?

Q. Right.

A. I would say yes, and there's some work on this being done recently as a matter of fact. And the work I'm referring to is Mr. Eason, again in Wawa, is involved in studying many aspects of this problem and recently he's reported to me that he's looked at an area where the moose guidelines were implemented and - it was a winter concentration area, 50 per cent cut and leave area - and he has found in fact that the moose are less vulnerable to hunting in that situation than in areas where the guidelines were not employed in the distant past. So there's some documentation.

Q. I'm very interested in that documentation. Could it be made available to me?

A. Well, it doesn't exist right now. As I say, it was a personal conversation with Mr. Eason. He's in the process of writing this up, so it doesn't exist today to give it to you.

Q. But you expect it in the near future?

A. I understand that they're going to publish it some time in the next year.

MR. HANNA: Mr. Chairman, I would like to receive that when it becomes available.

THE CHAIRMAN: Well, when it becomes available and it is published, I assume it will be a public document?

MR. HOGG: Sure. Yes, it will.

MR. HANNA: Q. Well, can I be put on the circulatation list for it, please, Mr. Hogg?

MR. HOGG: A. Yes, you will. Certainly.

Q. Mr. Hogg, you remember when Dr. Euler was here I spoke with him about Exhibit 518 which is the Racey, McNicol, Timmerman paper?

A. Yes.

Q. Now, this paper was looking at the matter of the relationship between forest access, modified cuts and optimum forest management. Is that a fair summary based on what it was looking at?

A. Well, specifically they dealt with the items of present imbalance of age structure and distribution of stands; No. 2 is minimum block size and maximum cut-over size; No. 3 is planning and execution of return cut; (4) was access; and (5) was identification allocation of priorities based on

productivity.

Q. Can we look at the second paragraph there in the abstract, please?

A. Yes.

Q. Do you agree that the Moose Habitat Guidelines can lead to requirement of higher investments by the timber industry through access road construction?

A. Yes, in the general case that can occur.

Q. Now, I believe Dr. Baskerville also spoke to this issue on page 25 of his report, Exhibit 16, the paragraph at the very bottom of that page. It seems his statements here are somewhat parallel to the statements in the Racey paper, Exhibit 518?

A. If I read Dr. Baskerville's words correctly, he's suggesting there may be benefits to leaving areas uncut and moving the road system along to other areas. That's the implication of his words, as I understand them, and I think that's what Mr. Racey, et al are talking about in part in their paper.

Q. Okay. So we have this potential if we make the investment -- in terms of increased access, we have the potential of a benefit not only in terms of timber, but in terms of non-timber values?

A. There is that benefit, yes.

Q. Have you undertaken any analysis to quantify the potential benefit that might accrue in the area of the undertaking, or a specific area in the area of the undertaking?

A. The cost and accelerated road system versus the benefit of non-timber values?

Q. Well, my question actually was to undertake any analysis to quantify the benefits.

A. Excuse me, the benefits of what now?

Q. An accelerated road access system of a nature that's talked about in the Racey paper, Exhibit 518, and that Dr. Baskerville speaks of in Exhibit 16 that I just referred you to?

A. I think we are both saying the same thing here, I think. The question is: Have we done an analysis of the benefits of accelerating the construction of access roads?

Q. Correct.

A. And, no, there isn't such an analysis to my knowledge.

Q. Okay. Can we look at the introduction which is on page 1 of the Racey paper, Exhibit 518. I would like you to look at the second sentence in the second paragraph starting with:

"At the same time..."

A. Yes.

Q. Do you agree that there will be an increased level of difficulty in reaching agreement on the application of the guidelines as indicated here?

A. I think the sentence is a fairly straightforward one. The demands for other users for products from that forest are increasing and this obviously is going to result in serious discussions on the needs of one user, the timber industry attempting to be balanced with the needs of these other users.

Q. Now, with this - I think your term was serious discussions - will those serious discussions revolve around the topics of both the size of the cuts that are permitted and the location and length of roads where required?

Would those be some of the primary topics that you would expect that would need to be discussed?

A. I would say those as well as the use of those roads, not just their numbers and location, but who is going to use them and under what conditions.

Q. So it follows that to optimize your forest access strategy, you have got to optimize that concurrently with your cutting practice; the two go hand-in-hand?

A. And that is why the road use management strategy is being incorporated into the timber management planning system so those things are all discussed in the same place.

Q. Well, perhaps I think you have gone a little bit ahead of me, but that is fine.

What you are saying then, I think, is that not only have you got to look at your forest access strategy, you have got to look at your cutting practices, you have also got to look at the needs of wildlife and the resultant benefits in terms of other Crown land recreationists, Crown land users?

A. Attempting to consider many variables in your decision, yes.

Q. Now, this is a topic that has been brought up before and it relates to this matter of the situation the forester finds himself in and particularly the company foresters and; that is, are they not faced with attempting to optimize, if you will, tradeoff all these variables that have differential implications from a private versus a public benefit perspective?

A. The person charged with the balancing, if you will, is not the company forester, per se, it's the district manager that approves the

plan.

Q. Right. I don't disagree with that at all. But in developing that plan that ultimately gets approved by the district manager, the company forester has to, if you will, screen through virtually an infinite number of alternatives before he comes forward with the one that ultimately goes to a district manager?

A. The planning team attempts to deal with all those variables, not a single individual.

Q. Mr. Hogg, I have two quick questions here on the Moose Habitat Guidelines, Exhibit 310. I am looking at page (ii), the green section under Specific Areas of Concern and, in particular, Section 1?

A. Yes.

Q. Now, Section 1 is the only paragraph in the guidelines dealing with access; is that correct?

A. That's correct.

Q. Is there anything in the evidence that you have presented in this panel that would permit Ministry biologists to predict the acceptable separation between access roads and the sensitive features listed in Section 1?

A. I'm sorry, acceptable separation...?

Q. To predict the acceptable separation distances between access roads and the sensitive areas described in Section 1.

A. Well, reference is made to all those various resource manuals that exist and those kinds of documents contain information about that kind of thing, the distance that is appropriate to where a road might pass or where it more properly should go so as not to have an adverse effect on a nesting bird or -- mostly nesting birds.

Q. But...

A. Now, this document --

Q. This document we're talking -- this doesn't pertain to nesting birds?

A. This document speaks to moose and there is information in here about areas of concern and the reserve 120 metres being put on those areas and that is the routine practice. When those areas are identified, that kind of reserve is put in place.

Q. Yes. You are reading now I believe from Section 2(e); is that correct?

A. That's correct.

Q. And it says there 'in general'. it doesn't say a 120-metre reserve will be required, it says 'in general' it should be left.

A. In general, a 120-metre reserve should be left, yes.

Q. Right. And I'm speaking specifically to your evidence. We have gone through the guidelines, I don't want to go back through them. I am just asking, in your evidence, is there anything that would go beyond what's in the guidelines in assisting Ministry biologists to determine the appropriate separation distances, your evidence on this panel?

A. Between a road and a moose aquatic feeding area?

Q. Take that as an example.

A. I believe the guidelines are alluded to in my evidence, so that connection is there.

Q. So in that respect there is information but nothing more than that?

A. Nothing more than that. These documents -- this document, moose guidelines, give our people direction as to what to do if they have that concern about moose and moose habitat.

Q. Mr. Hogg, I would like to move on to a new subject now and that is one of the minimum information required in order to lay out a forest access road and, particularly, I would like to look first at the witness statement on page 39, paragraph 30

-- excuse me, that is page -- I'm sorry, did I say page 39 paragraph 30?

A. Page 39 paragraph 30, yes.

Q. Now, what you're saying here is that since many specific features are visible, that if they are identified in the planning stage or the construction stage, potential adverse effects can be minimized or avoided. Is that the essence of what you are saying there?

A. If they are identified, then action can be taken to protect that particular value.

Q. And your words are:

"Many of the specific features are visible."

A. Yes. I think the word 'readily visible' should be added in there.

Q. I am happy with readily visible. I would like to take an example and see how this might work. And the example I take is a bald eagle's nest, and let's presume that it was not identified at the planning stage but it was identified during the construction of the road.

Now, what you are saying here is that even under this circumstance the potential adverse effects can be minimized and avoided?

A. When they are identified, yes.

Q. Well, we have identified, we have got the crew out there building the road and they say: Wait a minute, we have got a bald eagle nest right there.

A. Yes.

Q. They have identified it.

A. Yes.

Q. Now, let's add a little more to that bald eagle's nest and put the bald eagle's nest at the location of a water crossing, so it's on the shore of a river.

A. Okay.

Q. And it happens that that bald eagle's nest is in the middle of our 100-metre wide corridor that we have selected through this extensive timber management planning process.

Now, in that circumstance, would you not agree that it would be very difficult to avoid negative impacts on the bald eagle without relocating the water crossing, and that perhaps could even lead to relocating the entire road corridor?

MS. BLASTORAH: Mr. Chairman, may I just ask a point of clarification. I may have misunderstood, Mr. Hanna. Is he talking about a bald

eagle's nest in a moose corridor? Is that a moose corridor you said?

MR. HANNA: Oh, no, I am sorry, it was a -- I think I meant to say road corridor, Ms. Blastorah. I apologize.

Q. No, I am talking about roads now, roads and eagles.

MR. HOGG: A. Yes. So can you restate your question, please?

Q. Okay. So you have got this eagle's nest in the middle of a 100-metre corridor at a water crossing.

Now, in that circumstance would you not agree that it would be very difficult to avoid negative impacts without relocating the water crossing and perhaps even relocating the entire road corridor?

A. I think it would be an interesting decision you would have to make, yes. There ultimately could be some ramifications cases to it as you've described, first of all, relocating the water crossing and perhaps amending where the -- changing where the corridor were able to reach that area of concern. So those kind of things could occur.

Q. Mr. Hogg, have you ever prepared the natural environment component for an environmental

assessment of a new road, be it a forest access road or any type of road?

A. Have I ever prepared?

Q. Yes.

A. I have had the opportunity to make input to a road undergoing environmental assessment.

Q. Which was that?

A. Well, several in my time, I guess. Primarily a major corridor in southern Ontario, 400 and 404.

Q. And I take it you have examined the environmental assessments with respect to the natural environment component of those EAs?

A. I assume I did. We are talking some ancient history here. I can't remember exactly everything that happened.

Q. But I just -- you have got a general appreciation?

A. I believe I do.

THE CHAIRMAN: Didn't 404 have a problem in that the road was constructed without an EA?

MR. HOGG: Not quite that problem, Mr. Chairman. There was a problem.

THE CHAIRMAN: It was a deputy problem; wasn't it?

MR. HOGG: Ignorance is bliss, Mr. Chairman.

MR. HANNA: Q. I am not certain about this, but were you not at the Maple District when the Finch Avenue Extension Environmental Assessment was being prepared?

MR. HOGG: A. I do recall some discussions. I don't believe I ever saw EA documents, per se, on that issue.

Q. Now, in this particular case was there not a considerable amount of information collected on the natural environment?

A. I really can't speak to that one particularly.

Q. Okay. Well, how about Highway 404 or Highway 400 that you referred to?

A. There was information collected, yes.

Q. Specifically targeted for that particular undertaking?

A. Yes.

Q. Why, in your view, is it appropriate to collect relatively extensive primary information for similar types of undertakings in southern Ontario and not in northern Ontario?

MS. BLASTORAH: Mr. Chairman, I am not

sure that it has been established it was a similar type undertaking. My understanding is we are talking about the juncture of two major highways here as opposed to the construction of forest access roads in the bush. I would hardly call that a similar undertaking.

MR. HANNA: Q. I am asking you, Mr. Hogg, in terms of whether it's a similar undertaking from a natural environment impact point of view?

MR. HOGG: A. The natural environment is going to be impacted by both actions but Ms. Blastorah is right, in terms of the kinds of road you are talking about, and we have been talking about the 401 and 404, are vastly different than the kinds of roads than are being discussed here in this hearing room just in terms of the nature of the use of them and the volumes of traffic that are going to using those roads. I think those difference are significant.

Q. They are very significant in terms of say engineering design and that sort of thing?

A. I also think they are significant in terms of wildlife use. I talked about mortality, road kills in the written evidence and basically we don't consider them a particularly large factor in our evaluation of the forest access roads, but I do recall at some of those discussions about some of these major

roads in southern Ontario, that is very significant, at least from our point of view, the Ministry's point of view, we saw a very significant factor.

Q. Okay.

A. And as well as this whole thing ofjust generally disturbance of the environment. The other day Ms. Swenarchuk gave me the opportunity to address a paper that she had brought forth that talked about road density and road use.

Q. About populations?

A. Yes, an aversion factor to the roads and the aversion factor, if you will, can be far less on forest access roads than they are going to be with respect to these southern Ontario major thoroughfares.

Q. Okay. What about, though -- accepting what you have said in terms of the road kill issue and whatever, there is much information collected far beyond simply the expected road kill associated with these roads, there was a lot of other natural environment type information collected; is that not correct?

A. They did collect a lot of information on flora and fauna, as much as exists.

Q. And that is field information where there is actually someone goes out and surveys the

right-of-way?

A. Sometimes it is to generally supplement what is valuable but, to a large degree, we rely upon existing information too in many of those cases.

Q. Are you suggesting in the EA for Highway 404 that it relied primarily on existing information?

A. Well, looking in total, yes, it relied upon a total length of corridor, if you will, and relied upon existing information to a large degree. Where there was some additional concerns, crossing a wetland, if you will, then certainly there was work put into those areas.

Q. A fairly extensive amount of work?

A. They went to some considerable effort depending upon the particular concern they were interested in.

I must say that if such concerns were raised in the development of forest access roads, then a study would occur on those sites as well.

THE CHAIRMAN: What is the basic point here, Mr. Hanna?

MR. HANNA: Mr. Chairman, one of the positions that my client will be bringing forward in

this hearing is that the Board should consider entering as a term and condition in the timber management planning process direction as to the minimum amount of information that the proponent should have available in arriving at decisions on forest access roads.

That is the point of the question, Mr. Chairman.

MR. HANA: Q. Mr. Hogg?

MR. HOGG: A. I guess, just to make it clear, the Ministry's position at this point has been that we collect information across the area of the undertaking in the way that Mr. McNichol described and Dr. Euler described and we use that information despite whatever activity is planned there, it may be a road, it may be a harvest.

And given that harvest affects a fair larger percentage of the area of the undertaking than does roads, roads and their impact in one sense could be seen as a fairly minimum impact.

The estimate you have heard from this panel is that it's approximately an area of five per cent of the landbase that might be occupied by primary and secondary roads.

Q. Is it your view, Mr. Hogg, that the available file information and local knowledge of the

Ministry is greater in northern Ontario than it is in southern Ontario and, hence, the reason why in southern Ontario additional data has to be collected?

A. I think it has to do with concern about limited resources in the south as much as anything else. The woodlots are fewer, the wetlands are fewer, things that require that kind of habitat is limited, so the impacts of a road in those locations logically is going to be less than it might be if you are putting a road across a jack pine sand flat within the boreal forest.

Q. Does not the area of the undertaking extend as far south as almost -- I think actually Tweed?

A. Tweed is within the area of the undertaking, yes.

Q. Indeed that is actually south of the location that Highway 416 was located, in which there was an extensive amount of information collected specifically for that?

A. I have no knowledge of Highway 416.

MR. PYZER: A. If it helps any, Mr. Hanna, the Kenora Bypass that is going around Kenora that is a relocation of the TransCanada Highway - I believe it's 45- or $50-million - and I don't believe

there was any extra - I stand to be corrected on that, you might want to check it - but basically the information that the Ministry of Transportation at that time used in their planning was collected from the district office.

I don't believe they undertook any specific studies. They came in and got our bald eagle, our osprey, certainly the moose information and in terms of water crossings, we have laid a number of conditions on them in terms of work permit reviews and that sort of thing and we're monitoring how they cross those creeks.

Again, I stand to be corrected, but I don't believe there was any additional studies conducted.

Q. Now, Mr. Hogg, you have experience in southern Ontario and would you agree that, in addition to the Ministry of Natural Resources, there are many other public and non-public government agencies collecting environmental data that would be available in laying out road corridors?

MR. HOGG: A. There is some. I'm not sure the list is extensive.

Q. Conservation authorities, local, regional governments?

A. Yes.

Q. Naturalists groups?

A. Well, naturalists groups --

Q. Hunters and anglers groups. There is a whole -- a much higher density.

A. Well, you were talking about organized governmental groups I thought, and there would be conservation authorities, there would be municipalities, in some cases Hydro has collected information for their purposes that we can access.

But those other things you mentioned that is sort of public input, that can be as strong here as -- in the north as it can be in the south in terms of peoples' interests and information.

Q. Well, I'm not questioning at all the level of interest. You are suggesting that the level of information in terms of what the public has available in the north is comparable to what they have available in the south?

A. There is information available from those sources, that is what I am saying.

Q. Is it a fair assumption that it is highly unlikely that a Ministry biologist or someone skilled in undertaking natural environmental assessments would have undertaken inventory along a new

forest access road seeing that in most cases these areas are road inaccessible?

A. I beg your pardon? Say that again.

Q. Okay. Is it not a fair assumption that it is highly unlikely that a Ministry biologist or someone skilled in undertaking natural environmental assessments would have undertaken an inventory along a new forest access road seeing that in most cases these areas are road inaccessible?

A. I think it's reasonable to assume that if the biologist had a concern that he would in fact take a look on the ground to see whether or not that concern was warranted or not.

Q. I appreciate that.

A. Despite the lack of access.

Q. I appreciate that, but it's unlikely though that that inventory though has already been taken place, highly unlikely?

A. Unlikely that it has taken place routinely?

Q. Yes.

A. And in a detailed manner? I think the point is that if there is a concern we will go out there and attempt to identify the nature of it and its extent and that sort of thing.

If a flag hasn't been waved, no, we're not going -- we haven't been walking every square inch of every proposed road corridor to evaluate just exactly the nature of the flora and fauna on that site. We use the area of concern planning proposes we have already described.

Q. It's your -- I am sure you are aware of the addage that ignorance is bliss?

A. I've heard of it. I have perhaps used it sometimes.

Q. Is it your view that all natural features are of value are readily visible to the untrained eye?

A. Are all...?

Q. Is it your view that all natural features of value are readily visible to the untrained eye?

A. I think many of them are. Certainly the ones that we are concerned about during an undertaking are of that nature, but there are always those values that are less or more subtle that require training to identify and that is why we have spent some considerable effort in part -- we have spent some considerable effort in the area of the undertaking and elsewhere to document areas of concern of natural

scientific interest where there have been surveys undertaken for that purpose to identify those very special thihngs.

Q. I just want to make sure that I am right here and; that is, that there is no requirement in the proposed timber management planning process for someone with natural science training to analyse carefully the non-timber resources along a proposed route?

A. I believe that the person in charge of that responsibility on the planning team is going to be the biologist and those people he calls upon and those people he hires to investigate things that he thinks are worth investigating.

Q. But there is no requirement?

A. Sure, there is requirement that the man do his job. I think that is what you've asked me.

Q. Do you know of any studies or investigations to indicate if all significant natural features have been identified during the design of road corridors?

A. I undertook to canvass all districts in the area of the undertaking to ask them specifically if - after the planning stages for a road, and during the implementation stages of the construction stage of

the road - if they had encountered a wildlife value that necessitated either moving a corridor or moving alignment within the corridor.

And I asked them that for a five-year period, 83-88, and throughout the area of the undertaking in that period there were 13 instances where values were encountered and action was taken to protect that value; that is, during the construction stage there were 13 instances where action was taken to protect a wildlife value that hadn't been identified in the planning stages.

Q. I take it that is some documentation that you could make available to me?

A. It's not at this point summarized, but we can summarize it and certainly provide it to you, yes.

MR. HANNA: Mr. Chairman, that would be useful for me to have available to me.

THE CHAIRMAN: Any problem, Mr. Hogg?

MR. HOGG: Just one of time. I can't provide it today certainly, but give me a week I'll have it.

MR. HANNA: I'm in no rush, Mr. Chairman.

Q. Now, in this canvassing of the districts there is no one that went out and was

required to actually ensure - or how do you say - to look at what actually was there after the decision was made? In other words, this was something that somebody noticed in the statistics you've just described, they said: Oh, oh, we've got a bald eagle's nest here and we have got to do something. It was that sort of -- that's the sort of incident you are reporting?

MR. HOGG: A. The information is generally provided by the people cutting the centre line of the road, people laying out the actual alignment within the corridor.

Q. And who usually cuts the centre line and lays out that line?

A. Mr. Adamson can speak to his team, I guess.

Q. Mr. Adamson, who would normally do that? What level of training would they have and what kind of training would they have?

MR. ADAMSON: A. There's two things being talked about here; one is laying out a centre line which would be sort of a road locator, an individual -- probably a two- or three-person party with a compass or instruments.

The other one is actually clearing the right-of-way which is a big operation that involves

harvesting equipment.

Q. Yes. And what would be the training and experience of those people laying out the centre line, first of all, normally?

A. They would normally be experienced in doing that particular job, having a --

Q. Civil engineering technologist types?

A. Not necessarily; occasionally, yes, But I would say perhaps --

Q. Forest resources technicians?

A. Yes.

MR. HOGG: A. I think the point to be made here perhaps is that these people are also people, Ministry people, who are also going to be aware of the concerns of the Ministry and not be surprised but knowledgeable with the fact that we're concerned about various things, the most obvious of which are the bald eagles and the ospreys and the heronries and those sorts of things, moose aquatic feeding areas.

So training occurs in many ways, some of it formal and a lot of it informal. So I think that in the instances we're talking about, those people came forth with the concerns they know the Ministry is concerned about.

MR. TENAGLIA: A. It may not be a

requirement, but it certainly is a general practice to have the forester, the company forester, the Ministry forester or the technicians or even a field biologist to go out and look at different route alternatives in the -- during the planning process.

Q. Meaning to walk them?

A. Walk them in certain cases, certainly.

Q. In total.

A. Pardon?

Q. Like walk the total length of the corridor?

A. In some cases. If it's a primary road and the company really needs to know the exact location of that road, that's a common practice, and the biologist may certainly go along with the company forester.

Q. It's common practice for the biologist to go along?

A. I wouldn't say it's common practice, it certainly does occur.

Q. Mr. Hogg --

A. And we certainly depend on public participation in the planning process to identify those areas of concern.

Q. Mr. Hogg, in paragraph 30 on page 39, another one of the specific features that you've identified that are readily visible is moose mineral licks; correct?

MR. HOGG: A. Yes.

Q. I believe in my cross-examination of Dr. Euler he confirmed that the number of known mineral licks in the province in the area of the undertaking is -- I believe his number was 27.

A. I can't recall his specific number. There was an interrogatory with respect to that specific question.

Q. And I believe we estimated approximately there could be up to 60,000 in the province?

A. I don't recall that discussion.

Q. Well, I'm looking at Volume 93 -- Volume 94.

MS. BLASTORAH: Sorry, what page?

MR. HANNA: (indicating)

MS. BLASTORAH: (handed)

MR. HOGG: Yes.

MR. HANNA: Q. The discussion begins on page 15885 and carries over to 15886, and I believe on lines 17 to 22 I asked a question about the potential

number and I believe Dr. Euler said:

"Yeah. Okay, sure, and it will vary somewhat."

THE CHAIRMAN: Does the precise number make a difference?

MR. HANNA: No, Mr. Chairman, it's just that I just wanted to put him in the context of that discussion.

MR. HOGG: Well, I'm certainly not about to contradict Dr. Euler except to point out that mineral licks are associated with sedimentary rocks and not all those approach the surface of the earth over the Province of Ontario all throughout the moose range, and that's why I think personally you tend to see the occurrence of these things clumped where they're known.

If you look at the interrogatory that responded to this question way back then in Panel 10, they remain enclumped actually in the northcentral region in Thunder Bay District, and in part one connection that can be drawn anyways is the fact that there are sedimentary deposits close to the surface of the earth at that point. So you may not find mineral licks throughout the whole area of the undertaking.

MR. HANNA: Q. Well, I don't want to go back through the whole discussion I had with Dr. Euler

at this point, but I believe the basis of the discussion was that the four sensitive areas or critical areas that are identified in the Moose Habitat Guidelines are essential components essential to moose in terms of their --

MR. HOGG: A. I would, I guess, dispute the word essential. They seem to have some importance to them, but even where those features are not known moose still continue to exist in this Province of Ontario and that's a bit of an enigma for us, but we do recognize that where they do exist moose are attracted to them and, for that reason, we've identified them as important and asking that they be taken into consideration in timber management.

Q. Well, in those areas where you expect they do exist, the northcentral region or whatever, you know 27 -- seems to me 27 is not a very big area for the --

A. It's not a very big number, no.

Q. A very big number for the northcentral region. You'd agree with me there is probably a large number out there that aren't known?

A. We expect certainly that there are more mineral licks out there than we know at this point in time.

THE CHAIRMAN: Mr. Hogg, you would certainly know of a mineral lick in the area of where you want to construct a road; would you not?

MR. HOGG: It requires somebody seeing it and reporting it as such. And given that they're readily identifiable by the man in the -- cutting the centre line, then you would expect that those kinds of things would be reported and taken into consideration if necessary.

THE CHAIRMAN: And you would have local input if that was apparent to any of the local inhabitants; would you not?

MR. HOGG: We have all the information sources that Mr. McNicol spoke of in Panel 7. We rely upon our staff to report these things, we rely upon local people to report these things, we rely upon hunters to report these things, and even company staff are reporting these things.

MR. HANNA: Q. Now, Mr. Hogg, in what you have just said, that person cutting the centre line first of all would have to recognize that it was a moose mineral lick?

MR. HOGG: A. Yes.

Q. And you're suggesting that the people out there cutting the centre lines, in the vast

majority, would be able to identify those sites and are trained to identify those sites?

A. I'm suggesting that it isn't difficult to do so. The ones that I have seen personally, there obviously is a lot of moose activity, the area is moist, it's turned up, small --

Q. But you're a trained biologist.

A. But what I'm seeing is not rocket science, it's quite straightforward.

Q. It's not -- I'm sorry, I didn't get that, it's not...

A. I used the word rocket science. You know, it's very visible and I think people in our Ministry are aware of such things. They talk to one another, they know the clients, they talk to them.

Q. So they sit around coffee and talk about moose mineral licks?

A. They discuss several things.

Q. Now, the centre line, you'd see -- if a moose mineral lick was right on the centre line you would obviously see it, you're suggesting, because you would get stuck in it or whatever you do with moose mineral licks.

But what if the moose mineral lick is, say, 20 metres off the centre line, what's the

likelihood that it would be encountered then?

A. I think the likelihood is greater you're going to find it 20 metres off thecentre line than if it's 40 metres off the centre line or 100 metres off the centre line.

There are certainly going to be instances where mineral licks near a road that's actually cut through the bush are not discovered. That may happen, that will happen. It's a big province and lots of activity out there and there are going to be some cases where that happens.

THE CHAIRMAN: Will there be any areas in the forest where a forest fire would come through and be close to a mineral lick?

MR. HOGG: Yes, Mr. Chairman, there will be many of those instances as well.

MR. HANNA: What -- sorry, Mr. Chairman, I didn't...

THE CHAIRMAN: I asked whether there would be any areas in the forest where a forest fire, a wild fire might come through and be close to a mineral lick and the answer was: Yes, he would assume that would happen.

MR. HANNA: Q. Mr. Hogg, in the evidence in terms of harvesting, the Ministry's witnesses have

repeatedly indicated that the rationale for not being overly concerned about the impacts of harvesting on the natural environment is that it's alleged that these impacts basically replicate those naturally experienced in species indigenous to the boreal forest; is that correct?

MR. HOGG: A. We've indicated that harvest has a partial parallel, to a greater and lesser degree, with natural disturbance.

Q. And this is part of the reason that the conclusion has been reached that the types of impacts in the natural environment will likely be within the ability of the plants and animals to sustain that?

A. Yes.

Q. Now, accepting the validity of that proposition for now at least, would you agree with me that there is no comparable disturbance in the boreal forest natural cycle to building a primary access road other than perhaps glaciation?

A. I would agree that building roads does not have the same impact on the given piece of land as would harvest, but the parallel in terms of how we consider that effect is similar with how we consider harvest in the sense that, as I talked about already,

those effects of road construction given the amount of land occupied by roads in this province, the land base occupied by roads is relatively small; in the neighborhood of 5 per cent.

That doesn't mean that the effects in certain cases will not be significant for the flora and fauna over which that road passes, but it does mean that if we happen to cross a mineral lick with a road there is a large percentage of the land base out there with whatever number of mineral licks are there to provide that same kind of habitat for moose. So the point --

Q. Despite the fact you're saying there's only 27, they seem to be quite limited and all the other things that you've identified in the Moose Habitat Guidelines?

MS. BLASTORAH: Mr. Chairman, he just got Mr. Hogg to agree that there are inevitably more than 27. He can't have it both ways.

MR. HANNA: I didn't say that there was not less than 27, there was only 27, and I think Mr. Hogg's evidence was that there is a limited number of them.

THE CHAIRMAN: Well, with all due respect, Mr. Hanna, I think we will take judicial

notice of the fact that neither the Ministry nor any human being has probably covered every square inch of the boreal forest and that there may be areas out there that are totally undiscovered in the sense that the resources out there are unknown and that those resources might well contain mineral licks or flora, fauna or any other features.

And so the fact that there is 27 that are known does not indicate necessarily how many are out there.

MR. HANNA: Thank you, Mr. Chairman. Your direction there is quite helpful. I think the point that I was making I think you've summarized in what you said and I think that's fine.

Q. Mr. Hogg, this may be a minor point and perhaps you can clarify this for me. I'm looking on page 38 of your witness statement, I'm looking at the heading above paragraph 29, it says there:

"The Forest Access Effects on Terrestrial Wildlife."

And then I turn over and I look on page 40 and the heading just above -- page 40, the heading just above paragraph 38 says:

"Effects on the Aquatic Environment."

And I'm interested why you limited your

evidence only to terrestrial wildlife and not the terrestrial environment.

MR. HOGG: A. I can't think of a good reason why those words are there. I mean, it does speak to the effects of the terrestrial environment, I believe, with emphasis on the terrestrial wildlife obviously.

Q. Well, I see no reference in your evidence to some of the popular topics, at least in southern Ontario, such as rare plants like orchids and things like that that I'm sure you've encountered in your career, sensitive plant communities?

A. Well, all those sorts of things are taken care of in the -- excuse me, in the area of concern planning process, the idea of identifying a specific feature and then taking some action to avoid it.

Q. Is it your view that rare plant species, sensitive plant communities are readily visible to the untrained eye?

A. I think that's an example of where you need specialists to look at those things and that's why I talked about the ANSI program and, to a very large degree, we rely upon that program to identify important plant communities, not that we will not take

notice of people -- of reports of rare plants within the area of the undertaking otherwise.

We take appropriate action if they're encountered, but we do rely upon the ANSI program to find those significant communities.

Q. Based upon your best professional judgment, would you be of the view that the majority of the locations of rare plant species and sensitive plant communities are known in the area of the undertaking?

A. Are they specifically known?

Q. Yes.

A. I think in general they're going to be known to be associated with wetlands and very many of them can be associated with inaccessible areas, and I can recall Mr. Greenwood speaking to this topic in Panel 10.

THE CHAIRMAN: Surely, Mr. Hogg, can't my earlier comments apply to rare plants as well?

MR. HOGG: You mean there are going to be rare plants that relatively --

THE CHAIRMAN: Surely nobody envisages that every square inch of the boreal forest, or any other forest for that matter, is going to be surveyed or covered to discover what may be there.

MR. HOGG: I don't envisage that, Mr.

Chairman, no.

MR. HANNA: Just for clarification, Mr. Chairman, I don't want to leave the inference that I was suggesting it should be done comprehensively across the area of the undertaking. It was more the matter of whether specific targeted inventory should be undertaken on proposed corridors and not certainly over the entire area of the undertaking.

Q. Mr. Ward -- Mr. Hogg, I'm finished, I'd like to turn to Mr. Ward for a few questions and then I'll be finished.

Mr. Ward, I would first like to speak to you about a paper that I provided to you and Mr. Pyzer, I believe, yesterday evening.

MR. HANNA: Mr. Chairman, I would like to enter it as an exhibit.

(handed)

THE CHAIRMAN: Exhibit 811.

MR. WARD: Which paper is Exhibit 811, Mr. Chairman?

THE CHAIRMAN: A Bioeconomic Approach to Estimating the Economic Effects of Watershed Disturbance on Recreational and Commercial Fisheries, by Loomis.

MR. WARD: Thank you.

---EXHIBIT NO. 811: Article entitled: A Bioeconomic Approach to Estimating the Economic Effects of Watershed Disturbance on Recreational and Commercial Fisheries, by John B. Loomis.

MR. HANNA: Q. Mr. Ward, does this paper describe an explicit quantitative approach to predicting the impacts of erosion and sedimentation from timber harvesting and road building on commercial and recreational fisheries?

MR. WARD: A. I think there's an attempt at that, yes.

Q. Is this analysis not based on developing a systematic cause/effect linkage between the timber management activities and changes in the value of the fishery?

A. Yes, it does, but the problem is with valuing fisheries - and I think in these two examples that they looked at is, in the one case, a fishery is more valuable because it's primarily a recreational fishery; in the other it has less in terms of straight dollars -- dollar value because there is more commercial harvest as a food fishery.

And this is one of the problems that I think Mr. Pyzer alluded to yesterday in cross-examination, that when you start getting into

straight economic arguments some groups - and you can include probably native subsistence fisheries as well - are going to lose out on these types of things or a population of Johnny Darters which you don't necessarily have an economic value with right now would lose out. So I don't want to say this is the approach that we take.

Q. You would certainly agree with me that there are various sorts of -- sources of uncertainty in this analysis?

A. Yes, I would.

Q. Now, picture yourself being the fisheries biologist in this particular area, and I'm wondering in the absence of such an explicit analysis, do you feel that a fisheries biologist could have made as precise and defensible an estimate of the economic damages for decision-makers upon which to arrive at a decision?

A. No, but I wouldn't expect the fisheries biologist having to do that because we have the Federal Fisheries Act, we have a federal fish habitat policy that has been signed between - or to be implemented in Ontario - it has been signed between Ontario and Canada, Premier Peterson signed for Ontario, we're going to implement this federal policy

and basically it's a net gain of fish habitat in Ontario and the guiding principle is known at loss of habitat.

So we are not in the possess like they seem to be here in the forests in the United States of having a tradeoff of fisheries for timber values, we are looking at protecting all fish habitat in Ontario.

Q. Looking at this analysis from the public's perspective--

A. Yes.

Q. --and that could include someone like Dr. Quinney, or someone with less qualifications, I am talking about the public now and the full range of the publics that might be interested.

A. Mm-hmm.

Q. Would you not agree that the analytical procedure here is fairly transparent; in other words, it is easy to trace and follow?

A. You mean the logic of his arguments?

Q. Yes.

A. Yes.

Q. And how they arrived at their conclusion?

A. Yes.

Q. What their assumptions are?

A. Mm-hmm.

Q. Where they used professional judgment and where they used imperical information?

A. Well, I'm not so sure about that but, you know, they do outline the steps that they've taken in terms of determining cost.

I mean, you'd have to get into the details of professional judgment and everything. I would like to see some of the reports that are referred to in the references to really understand the assumptions and the limitations of his logic, I guess.

Q. So it's not all contained in this article?

A. No.

Q. But if someone were interested in following along in that logic they could take those references--

A. Yes.

Q. --particularly after digging them out and follow through the complete logic of the analysis?

A. Right.

THE CHAIRMAN: Would you estimate that a native commercial fisherman would read the article and follow along, understand why his commercial fishery is worth perhaps less than other fisheries?

MR. WARD: In that example, probably not, Mr. Chairman.

MR. HANNA: Q. Mr. Ward, in your experience in northwestern Ontario are you familiar with groups like Treaty 3 and NAN, any Indian individual, Indian Bands like the Shoal Lake Indian Band retaining experts to help them in interpreting this type of information?

MR. WARD: A. I'm aware that that occurs, yes.

Q. Notwithstanding your previous comments, could such an approach in your view be applied in Ontario?

A. It could be applied, yes.

Q. Could you turn to page 86, please, in that exhibit, Exhibit 811, and could you read the first sentence under the Conclusions, please?

A. "While improved timber harvesting practices in national forests have reduced the negative impacts on fisheries, the remaining effects are still economically significant."

Q. Could this conclusion also apply to Ontario?

A. I can't answer that in terms of I

don't expect to be economically significant. No, I can't answer that question, I don't know.

Q. Is the reason you can't answer that question because you haven't attempted to undertake the analysis?

A. Well, it's not only that, but I don't expect to have - in terms of our process - having negative impacts on fisheries that are going to be economically significant whether you do the analysis or not.

As I said, we're protecting fish habitat and fish population, so I don't expect to have any significant decreases in fish populations that you are going to see it reflected in economic values.

Q. Now, can we look at the third paragraph there, I believe, under the Conclusions, and I would like you to read the last sentence of the conclusions there, if you would please, starting with:

"Maintaining fishery productivity..."

A. "Maintaining fishery productivity by ending timber harvesting appears uneconomic and fisheries must continue to be maintained by use of stream buffer strips, sound road design and mitigation of unavoidable losses from timber

harvests."

Q. Now, there's two points there that I would like to deal with first. The first is, they mention here stream buffer strips, sound road design, mitigation of unavoidable losses. Those words sound, at least in their general way, to have a very familiar ring in terms of what this panel's evidence has been?

A. That's correct.

Q. So they're saying there will be some economic loss, at least in this particular case, even though we're practising those types of measures?

A. Yeah, it's possible. But I mean, again, I don't know what kind of buffer strips they are utilizing down there, whether theirs is the same as ours, whether they apply to the same kind of watershed.

Like, we're looking at streams that you can see on a 1:50,000 topographical cap. I don't know whether they apply buffer strips to those kinds of waterbodies.

In terms of sound road design, I'm not familiar whether their -- they have road guidelines and whether they're as comprehensive as the ones that we have in terms of trying to maintain, you know, vegetation within a hundred metres of the water crossing, narrowing the right-of-way and the types of

mitigation measures that we're discussing or have outlined in the road guidelines.

So theirs may not be as comprehensive and as complete as ours and, therefore, they probably still have problems.

Q. Mr. Adamson, you had made reference earlier to having looked at the U.S. standards. Can you comment in terms of what Mr. Ward has just said in terms of how the U.S. standards would compare to what we have being proposed here in Ontario?

MR. ADAMSON: A. I can't comment on the ones in the area of the study here. Some of the information I have seen from the Forest Service indicates that their standards are similar to our standards.

Q. Now, the other issue this raises, Mr. Ward, is these authors are saying it appears uneconomic to not harvest in this case, but that is not a decision, that is information that is taken forward to the decision-maker, the decision-maker decides then on the basis of this type of information and those other terms that you talked about where there is a local subsistence fishery, all those other, if you will, other factors the decision-maker has to take into account.

MR. WARD: A. Well, this points out the problem I have with just trying to relate it all to economics. In that case, the timber is -- regarding the Siuslaw Forest I guess which is where the timber is very invaluable in terms of the coastal California timber I guess it is, and there the fisheries value is related to -- most of the harvest is with commercial fisheries, food fisheries and the value isn't as high.

You can go and say: Well, we are not going to have any food fisheries, we are just going to turn it into a high quality tourism fishery charging people $500 a day to fish here and you jack up the fishery value and it becomes greater than the timber value and, again of course, the timber people can use different arguments: We are not going to turn it into pulp and paper, we are going to have saw logs here, or we are going to have very rare timber for furniture design.

So when you get into those kinds of things, I think it takes away from some of the decisions regarding like subsistence, about the traditional uses, some more of the social aspects that Mr. Pyzer talked about in his evidence, and the attempt to try and, you know, not have anybody become a loser but try and maintain more of a win/win type of

situation in our timber planning.

And I think that's the approach we are trying to take in Ontario.

Q. So what you are saying is this type of analysis shouldn't be the sole basis of the decision?

A. Exactly, right.

Q. But this type of analysis can be very useful in those discussions in arriving at the most appropriate decisions?

A. I think a lot of decision-makers like to see -- if there are some hard dollars value, what those dollar values are.

Q. Is that not the conclusion -- the final concluding sentence in this article; is that not basically what they are saying?

A. What is that, Mr. Hanna?

Q. The last -- the sentence in the article, page 86 says:

"Such application would improve the quality of information available to policy-makers on the bioeconomic impact of timber management on fisheries values."

Talking about transferring that

information to those policy-makers, those decision-makers?

A. Yes.

Q. It is not suggesting that this is the decision?

A. No.

Q. Can I turn to one last paper here --

MR. HANAA: And, Mr. Chairman, it looks like I am going to make my one o'clock target.

(handed)

THE CHAIRMAN: Exhibit 812.

---EXHIBIT NO. 812: Article entitled: Is cumulative watershed effects analysis coming of age?, by John Cobourn.

MR. WARD: What is the title of that paper?

THE CHAIRMAN: Is cumulative watershed effects analysis coming of age?, by Cobourn.

MR. HANNA: Q. Mr. Ward, I would like to speak to you about this paper and part of the reason I feel that you are the appropriate person to speak to on this is because I think it has -- or addresses some of the same topics that are included in your rationale for forest reserve, Exhibit 808; is that right?

MR. WARD: A. Somewhat some of the same arguments are put forward, yes.

Q. Can we look first on page 268, please. In the far right column, it is the fourth paragraph down, there is a sentence there that starts -- fourth paragraph under Legal Impetus, and there is a definition there of cumulative impacts. Perhaps you could just read it.

"...the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency or persons undertake such actions. Cumulative impacts can result from individually minor or collectively significant actions taking place over a period of time."

Now, can you live with that definition? Is that a reasonable definition for you to...

A. Yes, that is one of the definitions they have and also on the following page, the California Guidelines talk about:

"Cumulative impacts is two or more individual effects which, when considered together, are considerable or which compound or increase other environmental

impacts."

Q. And I would like to go back to page 267 for a minute, and excuse me if I go back and forth here I was trying to put it in some logical order.

Now, the first two sentences under Benefits, it says:

"Cumulative watershed effects analysis is basically an advanced means of controlling nonpoint-source pollution. It is a safety net for water quality, predicting impacts that might be missed if planning were carried out only at the project proposal level."

A. Yes, I see that.

Q. Now, first of all, you are aware that nonpoint-source pollution is a major environmental concern at the present time certainly in Ontario and much of North America?

A. Yes.

Q. And it's a very difficult thing to control; is that correct?

A. That's correct.

Q. But yet the cumulative impact can be quite significant?

A. Mm-hmm.

Q. Now, is it your view that the proposed timber management planning process operates at the project proposal level?

A. Well, it operates at the timber management planning level and if you want to call a timber management plan a project, yes. But, you know, also they can refer to projects on a certain development, on a particular waterbody as a project as well.

THE CHAIRMAN: Is that quite true if you look at the planning process in the context of the development of the overall guidelines in the first place?

MR. WARD: I'm not sure of your question, Mr. Chairman.

THE CHAIRMAN: Well, in the sense that the guidelines have been developed over time with certain objectives and certain prescriptions contained within them, et cetera.

MR. WARD: Mm-hmm.

THE CHAIRMAN: And then you superimpose upon those guidelines at a later stage perhaps a particular project--

MR. WARD: Right.

THE CHAIRMAN: --for which you continue

on the planning process, such as which area you are going to harvest. So it's not -- or if you're going to build an access road or something like that. So it's a continuum to a certain extent.

MR. WARD: That's correct.

THE CHAIRMAN: And it's not necessarily always focused at a particular project at a given point in time?

MR. WARD: That's correct.

THE CHAIRMAN: You have this broad infrastructure of planning mechanisms in terms of guidelines, et cetera, that have already been developed?

MR. WARD: That's correct.

MR. HANNA: Q. Do the guidelines operate on a watershed on a cumulative basis or are they designed at a project-specific level; in other words, this water crossing, this particular effect?

MR. WARD: A. No. I think the Chairman alluded to that. We have guidelines, both road and fish habitat guidelines, that apply to the area of the undertaking and when you come down to a specific project there you would use those parts of the guidelines that are applicable.

Q. Yes, I understand that. I guess the

question I was asking is: Are the guidelines based upon a cumulative effect analysis or are they based upon the effects associated with a specific activity, a road crossing...

A. Well, any kind of activity we have is going to -- I assume in terms of this cumulative watershed you're talking about water crossings upstream on tributaries, headwater areas, and if you don't apply the guidelines to those and just apply -- and then you do something further downstream, they may be minor but further downstream it maybe have major impact. This is what I understand from reading this paper.

And I think, as I said yesterday in terms of our guidelines, we are looking at trying to avoid, you know, the impacts on the upstream waters as well as downstream. So I don't expect a cumulative impact to occur.

Q. That is fine, I understand that you don't expect it to occur. My question is, though: Are they based upon that type of analysis?

A. I believe they are, yes.

Q. A watershed analysis is part of the timber management planning process?

A. Well, not in the way you phrased that question, but I believe in terms of the way the

guidelines were developed, whether they are roads -- road guidelines or the Fish Habitat Guidelines that we were looking at both of the headwaters to the bottom of the watershed to apply them.

Q. Perhaps I don't understand fully the Fish Habitat Guidelines and my recollection of the drawing that Dr. Allin put up was that in the cases where there is feeder streams coming into a lake and whatever, that those are encompassed within the Fish Habitat Guidelines.

A. Yes, because that is outlined in the minimal information policy.

Q. Right. But in a situation where we had a major lake or a large lake, that the guidelines wouldn't pertain specifically to--

A. Mm-hmm.

Q. --we had another lake downstream, I don't recall him ever saying that we would look at the impacts upstream and downstream and, therefore, decide on what's appropriate downstream.

A. Well, I'm saying that the lake that is upstream we wouldn't want any impacts to occur in it. No impacts occur on that lake, I would very surprised if impacts occurred on the downstream lake.

Q. But if lakes -- if impacts did occur

on the upstream lake, there is not a connection between those impacts and, therefore, the appropriate treatment of the downstream lake?

A. Well, I think the -- depending on how far you want to look downstream, but I think in terms of applying the guidelines and where the professional judgment occurs, you can have shoreline cutting upstream of a critical fish habitat, for example a spawning area, and our direction to people in the field is that you've got to be aware of those downstream impacts.

In other words, it's no good just having timber adjacent to that critical spawning habitat and a a hundred metres or 200 metres or 500 metres or a kilometre allowing extensive cutting to occur and erosion to occur because the sediment may be transported a kilometre downstream and affect that spawning area.

So you have got to look at that kind of impact. And I believe the Fish Habitat Guidelines do talk about looking at some of those downstream effects.

Q. Systematically?

A. Well, I don't know whether -- what do you mean by systematically? You mean, looking at every one -- every spawning area that occurs?

Q. Perhaps we can go back then to page 267. I am looking at the paragraph -- or the sentence that starts at the bottom of the first column. It starts:

"Both the California Department of Forestry and the Region 5 office of the U.S. Forest Service in San Francisco released new versions of their methodologies..." in terms of cumulative impact assessment. Have you reviewed these?

A. No, I haven't.

Q. So you don't know whether what is contained in those would also be contained in the Fish Habitat Guidelines?

A. No, I don't know that. Well, they do -- this paper does talk about, in the last page, page 270; doesn't it, about Forest Service Region's 5 methodology, just the summary and review of it in terms of the four-phased approach regarding calculating the natural sensitivity index of a given watershed and so on, the various phases there.

So that is the only knowledge I have of that methodology and we haven't done that kind of analysis.

Q. Okay. One last question on this and

we are finished, Mr. Ward.

A. Mm-hmm.

Q. Page 270, the centre column.

A. Yes.

Q. Right at the very top there, I think they are dealing with this matter we discussed yesterday and; that is, the potential for erosion to have significant effects on aquatic systems even if it isn't right at a water crossing. And they in fact give here how they dealt with that particular issue.

Do you see that? They have actually said here's the coefficients that we used.

A. Can you read out the sentence you are referring to?

Q. Sure. It says:

"If a road surface is given a coefficient of 1, then a tractor-yarded clearcut followed by broadcast a burn should have a coefficient of .33. In other words, three acres of clearcut that has been burned is assumed to create roughly the same amount of water quality impact as one acre of road surfaced."

Now, would you feel that that is a reasonable rule to apply in Ontario?

A. No, I wouldn't make a judgment whether that in California was applicable to Ontario's situation.

Q. What would be a reasonable rule in Ontario?

A. Well, again, I would have to look at, you know, how they determined these values. They give you those examples but they haven't -- I would like to look at their -- the actual references that is mentioned in this paper to see what they used to determine it.

They have got -- doubtedly, I don't know whether they would have shoreline reserves, for example, if they were clearcutting in an area and burned it. And that may be a reasonable -- in Ontario, if that occurred, but with a reserve there, that is going to be quite different in terms of water qualities impacts.

So I would like to see how they -- what their best management practices which they refer to in the United States are -- actually occur in this situation to know whether this would be, you know, comparable to what it is in Ontario.

As we said earlier, sediment from roads is our major concern rather than with harvesting. So I

would say it would be a much less ratio than one to -- one third of it from harvesting and burning.

Q. So that the erosion coefficient for roads effectively then would be higher?

A. I would expect in the rule of practices in Ontario and certainly in the past we've had reserves, we've had doughnuts all over the place and our road water crossings -- we didn't have the road guidelines in place.

So now with this situation I would expect the ratios maybe to change, but I would like to look at what they had in terms of, you know, their analysis, what they included to come up with those kind of numbers.

Q. Mr. Ward, just one last question and; that is, the views that you have given us in terms of the potential cumulative effects in Ontario are based solely on your observations on a number of sites but not upon any sort of scientific analysis or detailed study?

A. Again, I would have to ask you what you mean by sort of scientific analysis or detailed study? We've --

Q. Well, perhaps we can go back - I wasn't intending to do this - but if we go back to

Exhibit -- in Exhibit 367 you mention on page 2 the Seager Creek and Nestor Falls examples.

A. That's correct.

Q. Now, is it not true for those particular cases, the ones that are listed here, that when you were asked to provide the detailed data supporting these sites that it was not available?

A. Well, I wouldn't say that's true in those two examples. The Nestor Falls site we have a Lake of the Woods assessment unit monitoring that spawning area.

One of the concerns identified would be -- is the amount of sediment that was affecting that spawning area and actually it was the result of that we have done a habitat wildlife spawning bed rehabilitation project on Nestor Falls.

So in terms of, you know, a study we haven't really measured the amounts of sediment that have been deposited but, I mean, there was a visual observation by the assessment unit biologist that this was a problem to the spawning area.

In terms of Seeger Creek, we were looking -- again, we had made an attempt to assess the sediment that was coming down that creek from a washed out water crossing and seeing whether it actually

deposited in a spawning bed. And we had established sediment traps in the spawning bed and we had collected sediment samples from upstream, from the bank erosion as well as from the water crossing, and we did prove the fact that the washed out sediment -- the sediment that was used for the water crossing did end up in the spawning gravel downstream.

So we did do some assessment and I don't know whether you would call it a scientific study, but there was some assessment done on those two water crossings.

Q. Well, I would like to thank you, Panel, for your time.

MR. HANNA: And, Mr. Chairman, those are my questions.

THE CHAIRMAN: Thank you, Mr. Hanna. Ms. Blastorah, what kind of time are you going to require?

MS. BLASTORAH: Well, Mr. Chairman, I must confess it's a little hard to predict at this point.

Given your direction yesterday with regard to the Board's wishes for re-examination, I certainly made an effort last night to prepare as much re-examination as possible and I did spend a considerable amount of time doing that.

As a consequence, I presently have a fairly large number of questions, however, I think that given time I could probably whittle that down to considerably fewer, given the cross-examination today and additional time to review the evidence as a whole.

I think if I began my cross-examination based on what I have now, I would require about probably three or four hours to review the articles and so on that have been dealt with this morning and prepare cross-examination on that, and I would still I think be left in the position where I would have quite a few questions that I would have to ask simply because I hadn't had a chance to reconsider them.

I think I can undertake that if I could go tomorrow morning I could probably narrow it down to an hour or an hour and a half. In all honesty...

THE CHAIRMAN: And then Mr. Freidin would be in a position to commence right in with the direct on Panel 15?

MS. BLASTORAH: Yes. Now, it was left this morning when I last spoke with him that he was anticipating he would begin first thing tomorrow morning.

And I hate to put it in those terms, but I really think that I simply haven't had enough time to

narrow my re-examination. I think I can do a considerable amount of work in that area.

---Discussion off the record

THE CHAIRMAN: Okay. In view of your submissions and in the interests of your last consideration of possibly getting the direct down to--

MS. BLASTORAH: I seriously think I can.

THE CHAIRMAN: --a much lesser amount than would otherwise be the case, the Board would be prepared to start tomorrow morning at nine o'clock.

MS. BLASTORAH: In all honesty to the Board and in all frankness, I think I can narrow it considerably over this evening. If I tried to do it this afternoon, I don't think that I could.

THE CHAIRMAN: That is quite reasonable. Please convey our wishes to Mr. Freidin that we would like to commence with the direct immediately after you are finished.

MS. BLASTORAH: I will do that. Thank you very much, Mr. Chairman.

THE CHAIRMAN: Thank you. We'll adjourn until nine o'clock tomorrow morning.

Thank you.

---Whereupon the hearing adjourned at 12:50 p.m., to be reconvened on Wednesday, September 13th, 1989, commencing at 9:00 a.m.